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The Blattoptera fauna of Switzerland and the adjacent regions of France, Italy and Austria
I. The species of the *sylvestris*-group of *Ectobius*

(Blattellidae, Ectobiinae)

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In the first part of the revision of the Blattoptera of Switzerland the species of the *sylvestris*-group of *Ectobius* Stephens are treated. Two species of this group are already known: *E. sylvestris* (Poda) and *E. lucidus* (Hagenbach) which are widely distributed in Switzerland. One species is new for the country: *E. eckerleini* Harz, hitherto only known from the type locality in France, has been found in the cantons Waadt (Vaud) and Wallis (Valais) and also in several departments of southern France. Two other species are new to science: *E. ticinus*, spec. nov., is found in Tessin and the adjacent parts of Wallis and Graubünden (Grisons); in Italy in the southern Alps in between Valle d'Aosta and Lake Como. *E. supramontes,* spec. nov., occurs in Engadin (Graubünden); outside Switzerland it is found in Italy in the southern Alps between Lake Como and the river Adige, and in Austria near the border towards Engadin. The new species are described, depicted and compared with the known species. Important features in the male for the discrimination of the species of the *sylvestris*-group are shape of glandular pit, genital sclerites (helmet sclerite) and paraproct structures; in the female genital sclerites and colouration of abdominal segments. A key for the determination of the Swiss species and maps showing their distribution are presented.

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Introduction

The Blattoptera fauna of Switzerland is still very poorly known. The last comprehensive work was published more than 80 years ago by Fruhstorfer (1921). It is of only restricted value since it appeared prior to Ramme's revision of the genus *Ectobius* Stephens in which the till then chaotic situation in the taxonomy of the European *Ectobius* species was clarified (Ramme 1923). Therefore, many of Fruhstorfer's determinations remain doubtful.

In Ramme's revision 7 species of *Ectobius* are listed as occurring in Switzerland: *E. erythronotus* Burr, *E. lapponicus* (Linnaeus), *E. pallidus* (Olivier), *E. (Capraiellus) panzeri* (Stephens), *E. punctatissimus* Ramme, *E. sylvestris* (Poda), and *E. vittiventris* (Costa); to these *E. lucidus* (Hagenbach) has to be added since the type specimen was found in Switzerland. Including two *Phyllodromica* Fieber and a *Loboptera* Brunner v. W. species recorded by Fruhstorfer, a total of 11 wild species of Blattaria has been reported from Switzerland.

During the following decades the Swiss Blattoptera fauna was almost completely neglected. The only investigation dealing with Swiss Blattoptera was that of Hofmänner (1951) about the Orthoptera of the Schweizer Nationalpark containing also some records of cockroaches. Since, however, only females and larvae were found, an exact determination was not possible. In the comprehensive works on the European fauna by Princis (1965) and Harz (1976) the Swiss fauna was only treated incidentally, without presenting new recordings from Switzerland. It was not before the beginning of the next century that papers dealing with Swiss cockroaches appeared again: Landau & al. (2000) and Baur & al. (2004) report the obviously rapid expansion of a southern species *(Ectobius vittiventris)* into northern regions of Switzerland. Baur & Coray (2004) revised types and type specimens established by Fruhstorfer.

With the present paper the overdue revision of the Blattoptera of Switzerland is started, dealing first with the *sylvestris*-group of *Ectobius*. The revision is, on the one hand, based on the material of most of the Swiss museum collections. An especially rich collection was established by Dr. L. Reser (museums Luzern and Lugano) consisting of about 800 specimens captured with light traps mainly in Tessin over the last 25 years. The museum material is, on the other hand, supplemented by material collected by the author, especially from southern Switzerland and from the adjacent parts of France, Italy and Austria.

Materials and methods

Explanation for the sections "Material studied"

The localities of Switzerland are grouped with respect to the corresponding cantons, which are arranged alphabetically according to their abbreviations: AG (Aargau), BE (Bern), BL (Basel-Land), BS (Basel-Stadt), FR (Freiburg), GE (Genève, Genf), GL (Glarus), GR (Graubünden, Grisons), JU (Jura), LU (Luzern), NE (Neuchâtel), OW (Obwalden), SG (St. Gallen), SO (Solothurn), SZ (Schwyz), TG (Thurgau), TI (Tessin), UR (Uri), VD (Vaud, Waadt), VS (Valais, Wallis), ZG (Zug), ZH (Zürich). Within each canton the samples from the various museums are kept separately and listed in the following order: Basel (Ba), Bern (Be), Chur (Ch), Frauenfeld (Fr), Genève (Ge), Lausanne (La), Lugano (Lg), Luzern (Lz), Neuchâtel (Ne), Solothurn (So), Zürich (Zü), followed by the material collected by the author (HB). In each of these sections the localities are listed alphabetically; material without specified locality within a canton is put at the end. Geographical terms which I could not localize within a given canton have a question mark (in brackets) behind the name. Such questionable localities are, of course, not contained in the distribution maps. Material of doubtful derivation is placed after the cantons under XX.

In order to allow a clear identification of the museum specimens, the inscriptions on the labels are cited as literally as possible; different writings or abbreviations for the same collector, for example, are taken over from the labels. However, name or abbreviation of country and canton are omitted and the dates have been standardized. Additions or explanations of the author are put in brackets.

The localities of the material collected by the author have an identification code consisting of one or two letters designating the country (A=Austria, He=Switzerland, F=France, It=Italy) and a serial number. Example: "He 52" means locality no. 52 in Switzerland. The code is put in parentheses at the end of the collecting data of the respective locality. When a microscopical preparation has been made of an animal from that locality an individual number – separated by a slash – is added to the locality number. Example: "male, slide He 52/3" means that a microscopical slide has been made of one of the males from that locality. Slide and corresponding animal (pinned or in alcohol) are labelled with this identification number. In this case a separate locality number is not presented, since it is already contained in the identification number. Preparations made from museum material are designated with "Bo" (abbreviation of the author's name) and a serial number.

Records from localities which are situated outside the area of the distribution maps are designated with an asterisk.

Uncertain determinations are indicated by a question mark (in parantheses) placed before the specifications (number, sex, stage) of the corresponding specimens.

Preparation of microscopical slides, figures

For the study of the various cuticular structures important for the discrimination of the species (glandular pit, helmet sclerite, paraprocts, etc.) microscopical preparations had to be made. Usually, the complete abdomen was removed from the animal, treated with KOH, washed with water, and dissected; the pieces were then transferred to alkohol and xylol, and finally mounted in Canada Balsam on a microscopical slide.

A similar procedure was also performed with other parts of the body used for photographs. For the reproduction of colour patterns it has to be noted that the white colour, for example in the surroundings of the pronotum disk, is lost during the treatment with KOH. Wings were not treated with KOH prior to embedding. If not stated otherwise, the position of the structures in the figures is with the anterior end on top.

An earlier paper (Bohn 1989) already contains pictures from some of the species treated here. They are cited in the following text with numbers and small letters as they are designated in the respective paper: "Fig. 1a". Numbers with capital letters refer to the figures of the present paper: "Fig. 1A".

List of museums and their abbreviations

Abbr.	City	Museum
Ba	Basel	Naturhistorisches Museum Basel
Be	Bern	Naturhistorisches Museum Bern
Cf	La Chaux-de-Fonds	Musée d'Histoire Naturelle
Ch	Chur	Bündner Naturmuseum
Fr	Frauenfeld	Naturmuseum Thurgau
Ge	Genève	Musée d'Histoire Naturelle de Genève
La	Lausanne	Musée Cantonal de Zoologie Lausanne
Lg	Lugano	Museo cantonale di storia naturale, Lugano
Lz	Luzern	Naturmuseum Luzern
Ne	Neuchâtel	Musée d'Histoire Naturelle Neuchâtel
So	Solothurn	Naturmuseum Solothurn
Zü	Zürich	Entomologische Sammlung der ETHZ
ZSM	Zoologische Staatssammlung München	

Other abbreviations

L = larva, nymph
ex L = grown from larvae (nymphs); identification number of these animals underlined
O = ootheca(e)
S = abdominal sternite
T = abdominal tergite

Results

The species of the *sylvestris*-group

The group consists of 6 known species: *Ectobius eckerleini, E. lucidus, E. sylvestris, E. brunneri* Seoane, *E. pyrenaicus* Bohn, and *Phyllodromica chopardi* Fernandes (Bohn 1989). The latter three are endemic to the Iberian Peninsula. They differ in part of the characteristics described below: In *E. pyrenaicus* and *P. chopardi* the males have shortened tegmina not reaching the end of the abdomen and the hind wings are rudimentary in both sexes. Moreover, *P. chopardi* has a glandular pit on T7 with deep pouches not found in other species of the group. *E. brunneri* agrees in its characteristics with the other species outside the Iberian Peninsula but is easily distinguished by its light, straw-coloured pigmentation; the females of this species are unique in having tegmina with broadly rounded, almost truncate apex.

Characteristics

Morphological features. Males with fully developed wings at least reaching or surpassing the end of the abdomen. T6 at the posterior border with a moderately deep, broadly rounded concavity (Fig. 5F). T7 posteriorly weakly, more angularly excavated (Fig. 5G). Glandular pit of T7 relatively large (measuring ⅓ or more of the segment breadth and ½ or more of the segment length), transversely oval to rounded, moderately deep, open bowl-shaped, with a flat bottom covered with dispersed bristles having a curved tip. The posterior wall of the pit is rather steep, in microscopical preparations appearing as a sharp contour line (Fig. 5K), towards the bottom often hollowed out posteriorly to a very shallow, in dorsal view narrowly crescent-shaped, pouch (Fig. 1f); the anterior wall is much less steep, gradually sloping down to the bottom. Subgenital plate with a small unspecialized stylus (the left); genital sclerites with a helmet sclerite.

Females with shortened wings not reaching the end of the abdomen; oothecae with about 14 rather strong longitudinal ridges.

Colouration. The general pattern of colouration and the range of variations are described here. In the descriptions of species only important deviations from this pattern will be mentioned.

Head. Variously coloured, between almost completely dark (blackish) and mainly lightly brownish or yellowish; in females usually with lighter pigmentation than in males. Regular features are a narrow whitish or yellowish transversal band in the posterior part of the interocular space (in very dark species/specimens sometimes obscured), and anteriorly adjacent – when the head is otherwise lighter pigmented – a broad darker band (darker than the following frontal parts).

Pronotum. Disk hoof-shaped, posterior corners with or without slight lateral extensions, rarely more rounded, completely dark (blackish or dark brown) or variously lightened, in colour (lighter brown, reddish brown, orange-ochreous, yellowish, or straw-coloured) and extent, preferentially in the central area with the margins or only the posterior corners remaining darker, at the most completely lightly coloured. Legs. From nearly completely dark to almost completely yellowish; in females usually lighter pigmented than in males.

Tegmina. There are several elements contributing to the colouration pattern of the tegmina. 1. Dispersed fine dark dots mainly along the veins. This pattern is especially evident in in the lightly pigmented *E. brunneri* (Fig. 13d); in the other species it is more weakly developed and mostly obscured by other patterns. 2. Darkenings of the interspaces of the veinal network causing a more or less pronounced mottling of the tegmina (Figs 4A,H). 3. Relatively large dark patches mainly in the distal two thirds of the tegmina brought about by the extension and fusion of interveinal darkenings. They are more often found in females (Figs 4C,D,H,I) than in males (Figs 4A,F). 4. Darkening along the the veinal trunk at the base of the tegmina (Fig. 4H).

Abdomen. Male: Tergites. Mostly dark brown, median part of all tergites lighter brown together forming a broad indistinct longitudinal band, but with transversal ridge and surroundings often remaining darker. Posterior tergites (T5 ff.) additionally lightened yellowish at the posterior margin and corners; T7 often almost completely yellowish with only small dark markings remaining anteriorly (Figs 6E-H). Sternites. Darker than tergites, lateral and posterior margins may have relatively narrow yellowish lightenings, especially on the posterior segments. – Female: Segments usually with lightly coloured lateral and posterior margins, the outer parts rather narrowly whitish, inwards followed by yellow. Tergites 2-6. Mostly dark, with variously broad whitish-yellow lateral and posterior margins, in the posterior corners often triangularly extended, sometimes with yellow patches within the dark anterior area (as in Fig. 14D, and larger). Tergites 7-10. Yellow areas usually larger than in the preceding segments. Sternites 2-6. Dark, with lightly coloured lateral and, in most cases, also posterior margins. The yellow area often variously extended: With two lighter coloured patches in the dark anterior area (Fig. 15F), which may extend and fuse with the yellow posterior area (Fig. 15G); finally the posterior half or more of the sternite may be yellow (Figs 14F, 15H). S7 (Subgenital plate). Either mostly dark, with a small yellowish area at the latero-posterior margins (Fig. 14K), or variously lightened with lighter brown or yellow, in the extreme with only the anterior margin and two patches at the posterior margin remaining dark (Fig. 15L).

Features important for the discrimination of the species

Males. Glandular pit. The differences in the structure of the glandular pit are not very dramatic; they mainly concern size (breadth) and shape of the pit and of its posterior contour line. The breadth of the pit (distance between the two ends of the contour line) is compared with the breadth of the lateral margins (distance between pit and lateral edge of the segment) (Tab. 1). *E. ticinus* has the smallest pit, being not broader than the lateral margins (about 100 %); in all other species the pit is considerably broader (>120 %). The shape of the glandular pit is outlined by the posterior contour line and the anterior border of the bristle field. It may be more transversal, as in *E. lucidus* (Figs 7F,G) and *E. supramontes* (Figs 6G-K), or more rounded as in *E. sylvestris* (Figs 7B,C) and *E. ticinus* (Figs 5G-K). The pit of *E. eckerleini* (Figs 8B,C) is somehow in between; it is otherwise characterized by especially long and densely arranged bristles along the posterior margin.

Helmet sclerite. The helmet sclerite is a small sclerotization of the endophallus wall. At rest, with genitalia retracted, it is located at the base of the subgenital plate between the right and left phallomere (Figs 9E, 1b). It is not restricted to the *sylvestris*-group but is also found in a series of related groups. – A rapid tentative analysis of the structure of the helmet sclerite is possible in living anaesthetized animals: By pressing the abdomen the sclerite can be extruded with the endophallus and analyzed under a stereomicroscope. For a more detailed study microscopic preparations are preferable.

In *E. sylvestris* the sclerite has the shape of a

Tab. 1. Measurements of length of pronotum and tegmina and of the relative breadth of the glandular pit (= breadth of pit / breadth of margin) in *Ectobius* species. n number of specimens used for the measurements of glandular pit size; the numbers for the other measurements are listed in the descriptions.

	Length of pronotum (in mm)				Length of tegmina (in mm)				Relative breadth of glandular pit (%)		
	Male		Female		Male		Female				
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	n	Range	Mean
E. sylvestris	2.0-2.3	2.1	2.1-2.6	2.4	9.2-11.1	10.0	4.6-5.9	5.2	14	111-153	122
E. lucidus	2.3-2.6	2.4	2.4-2.9	2.7	10.3-11.7	11.0	5.9-6.9	6.4	26	109-170	130
E. eckerleini	2.1-2.4	2.2	2.2-2.5	2.4	9.0-10.7	9.8	4.7-5.5	5.1	20	116-175	137
E. ticinus	2.1-2.5	2.3	2.2-2.8	2.5	10.3-12.3	11.4	5.1-6.5	5.9	23	83-112	101
E. supramontes	2.1-2.3	2.2	2.1-2.6	2.4	7.4- 9.9	9.1	4.6-5.9	5.2	22	108-167	128

laterally compressed helmet with the vertex pointing posteriorly, the opening for the face at the right, and opposite with an elongated neck part angularly set off from the main helmet (Figs 9A-D). The helmet is not exactly bilateral-symmetrical its right side (ventral in the animal) usually being more extended (Figs 9B,C). The surface of the sclerite is covered with acute scales (microtrichia) pointing towards the neck part.

The shape of the helmet varies between the species: In *E. sylvestris* (Figs 9A-D) the helmet is – as seen from its lateral side – fairly isodiametric; in *E. lucidus* (Figs 9E-H) it is higher and narrower; and it is still higher and narrower, almost gutter form, in *E. eckerleini* (Figs 10A,B). Two species, *E. ticinus* (Figs 10E-G) and *E. supramontes* (Figs 10C,D), have a completely aberrant helmet sclerite: The sclerite is no longer helmet-shaped, but forms a low and flat mound, oval in outline as seen from above (dorsal).

Paraprocts. The paraprocts are the sclerotized parts of the subanal lobes. The anus is enclosed in between the posterior ends of the subanal lobes and the small supraanal lobe (epiproct). Paraprocts and epiproct are considered as remnants of S10. The paraprocts are paired, but they show a strong left-right asymmetry.

Each paraproct (Figs 11A,B) consists of three parts: a central part (cp), forming the joint with T10, and, arising from there, two medially diverging arms: the medio-anterior arm (ap) and the medio-posterior arm (pp). In the right paraproct the three parts are fused to a relatively strong angular sclerite covering most of the subanal lobe. The central part of the right paraproct bears a strong, curved, medially directed spine (sp) presumably involved in the coupling between male and female genitalia. In the left paraproct the three parts are separate and rather small sclerites only partly covering the corresponding lobe; a spine is not present.

At the medio-anterior arm of the right paraproct two parts may be distinguished, separated by some kind of a furrow (arrow in Fig. 11B): a narrow, flat, bandlike proximal part being connected with the central part of the paraproct, and a more extended, variously shaped distal part with at least partly elevated surface. The two parts of the arm may be partly separated by a more or less deep lateral incision (arrows in Figs 11G,I,K).

Praeparaprocts (T10a). Anteriorly of the paraprocts is another pair of small sclerotizations (Figs 11A,B; pr). Each consists of a narrow lateral sclerite stripe lying just anteriorly of the ventral end of T10 and surpassing it considerably. The smaller left one (in the picture on the right) does not reach the ventral midline; it bears, shortly before its median end at the posterior side, a weakly sclerotized egg-shaped or globular structure. The larger right sclerite rises to a mostly membraneous club-shaped process fairly reaching the midline. The sclerotizations most likely are derivations from T10 and should be designated as T10a (Klass, pers. comm.). For practical reasons I call them praeparaprocts.

There is little variation in size and shape of these structures among the species of the *sylvestris*-group; but considerable differences can be found between the various species-groups of *Ectobius* and *Phyllodromica*. The praeparaprocts seem to be restricted to Ectobiinae.

Females. Genital sclerites. The genital sclerites of the females may be divided into an extended dorsal and a much smaller ventral complex. The latter is rather invariable and not further considered here (Fig. 1i); the dorsal complex, however, shows species specific variations in the structure of some of the sclerites.

The most prominent sclerites of the female genitalia are the basivalvular sclerites. In *E. sylvestris*, *E. lucidus* and *E. eckerleini* they are long and strongly converging anteriorly; *E. ticinus* and *E. supramontes* have shorter and less strongly converging sclerites (Figs 16A-E).

In *E. sylvestris* some kind of spermathecal plates are present, appearing as a pair of weakly sclerotized areas lying between the basivalvular sclerites (s in Fig. 16A). They are not always well developed, and in the seemingly closely related species, *E. lucidus*, sometimes similar structures may be indicated.

Another set of sclerites with some species specific variations is situated in between the intercalary sclerite (i) and the posterior lobe of valvifer II (f); the structures are designated here as prae-intercalary sclerites. Usually two such sclerites in parallel orientation are present on each side, a superficial posterior (the upper in Figs 16F,G) and a more deeply located anterior one. The latter may be missing (Fig. 16I); only the posterior is considered here. It also shows considerable intraspecific variation, and the identification of a species by means of only the shape of this sclerite is usually not possible; but it can be helpful for the determination in pairs of otherwise very similar species (*E. sylvestris* – *E. lucidus*, Figs 16F,G; *E. ticinus* – *E. supramontes*, Figs 16H,I).

Keys for the determination of the species of the *sylvestris*-group occurring outside the Iberian Peninsula

Males

1. Disk of pronotum completely dark; glandular pit of T7 large, considerably broader than lateral margins of the tergite, rounded, posterior contour line strongly curved throughout (Fig. 7B); helmet sclerite fairly isodiametric, with a marked neck-process (Fig. 9C); right paraproct: medio-anterior arm rather small, distal part very narrow (Fig. 11D) .... *Ectobius sylvestris* (Poda)

– Disk of pronotum never completely dark, variously, though sometimes only minimally lightened; glandular pit either smaller, not broader than the lateral margins of the tergite (Fig. 5G), or posterior contour line less strongly curved (Fig. 6G); helmet higher and narrower (Fig. 9G) or sclerite not helmet-shaped at all (Figs 10F); right paraproct: medio-anterior arm large, distal part broader, fairly triangular (Fig. 11G) .... 2.

2. T6: median part of transversal ridge angularly bent anteriorly (Fig. 7E), bristles on the surface of the tergite short and weak (Fig. 7H); T7: posterior contour line of the glandular pit forming a very shallow bow, pit strongly transversal (Fig. 7F) .... *Ectobius lucidus* (Hagenbach)

– T6: median part of transversal ridge gradually and less strongly bent anteriorly (Fig. 7A), bristles on the surface relatively long and strong (Fig. 7D); T7: posterior contour line of glandular pit at least with lateral parts stronger curved anteriorly (Fig. 8B), pit rounded or transversal .... 3.

3. Tegmina usually with some not very dark patches near the apex, veinal trunk without or with only very narrow darkening (Fig. 13c); lateral edges of T6 densely covered with short, but relatively strong bristles (Fig. 8E); glandular pit along the posterior margin with long, quite densely arranged bristles (Fig. 8C); helmet sclerite very high and narrow (Fig. 10B) .... *Ectobius eckerleini* Harz

– Tegmina mottled, but usually without dark patches, veinal trunk well darkened (Fig. 4A); lateral borders of T6 with few and weak bristles (Fig. 8F); bristles along the posterior margin of the pit smaller and less dense (Fig. 5I); helmet sclerite not helmet-shaped, but forming a flat mound (Fig. 10F) .... 4.

4. Larger, length of tegmina 10.3-12.3 mm; glandular pit rounded, small, about as broad as the lateral margins of the tergite, posterior contour line strongly curved throughout (Fig. 5G); right paraproct: distal part of medio-anterior arm long, tongue-shaped, with cut or acute tip (Fig. 11K) .... *Ectobius ticinus*, spec. nov.

– Smaller, length of tegmina 7.4-9.9 mm; glandular pit transversal, large, considerably broader than the lateral margins of the tergite, posterior contour line in the middle flat, laterally more strongly curved (Fig. 6G); right paraproct: distal part of medio-anterior arm short, triangular, with acute tip (Fig. 11I) .... *Ectobius supramontes*, spec. nov.

Females

The determination of the females in the genus *Ectobius* is usually very difficult or impossible. In the *sylvestris*-group colouration and genital sclerites offer means for a quite certain determination, which, however, often requires the making of microscopical preparations, – even for the study of colouration since important parts of the segments may be hidden in dried or fixed animals. The following key should be used only for a preliminary orientation. Colouration characters could only be partly integrated. For a further confirmation of the determinations the colouration should be thoroughly studied and compared with the descriptions and accompanying figures.

1. S2-6 mostly dark, laterally and often also posteriorly with lightly coloured margins (Figs 12G, 13G); basivalvular sclerites less strongly converging anteriorly (Figs 16D-E) .... 2.

– S2-6 as above, but lighter pigmentation more extended: usually at least with lighter brown or yellow patches in the dark anterior area (Figs 14H, 15F), in the extreme the posterior half or more of the sternite yellow (Figs 14F, 15H); basivalvular sclerites strongly converging anteriorly (Figs 16A-C) .... 3.

2. Larger, length of tegmina 5.1-6.5 mm, mean 5.9 mm; latero-posterior corners of pronotum disk usually with slight lateral extensions (Figs 12A-C,E; but see Fig. 12D); posterior prae-intercalary sclerites relatively broad (Fig. 16H) .... *Ectobius ticinus*, spec. nov.

– Smaller, tegmina 4.6-5.9 mm, mean 5.2 mm; latero-posterior corners of pronotum disk without lateral extensions (Figs 13A-D); posterior prae-intercalary sclerites narrower (Fig. 16I) .... *Ectobius supramontes*, spec. nov.

3. Tegmina short (4.7-5.5 mm, mean 5.1 mm), without darkened veinal trunk, but with numerous small dark patches; pronotum disk usually almost completely lightly coloured, indistinctly hoof-shaped, with or without small darker markings (Fig. 15C, Figs 12g-i), rarely distinctly hoof-shaped, with darker posterior corners (Figs 15B) or almost completely dark (Fig. 15A), posterior corners without lateral extensions .... *Ectobius eckerleini* Harz

– Tegmina of various size, with darkened veinal trunk, either with fewer but larger patches or without patches; pronotum disk distinctly hoof-shaped, usually darker, mostly at least posterior corners dark, the latter with slight lateral extensions .... 4.

4. Tegmina relatively long (5.9-6.9 mm, mean 6.4 mm); pronotum disk never completely dark, often with a striking yellowish reversed y-shaped marking (Figs 11a-g); spermathecal plates missing (Fig. 16B); posterior prae-intercalary sclerites relatively broad, strikingly dark (Fig. 16G) .... *Ectobius lucidus* (Hagenbach)

– Tegmina shorter (4.6-5.9 mm, mean 5.2); pronotum disk usually completely dark, if partially lightened usually without a striking yellowish reversed y-shaped marking (Figs 10a-f); spermathecal plates usually present (Fig. 16A); posterior prae-intercalary sclerites narrow, lighter pigmented (Fig. 16F) .... *Ectobius sylvestris* (Poda)

Description of the species

Ectobius sylvestris (Poda, 1761)

Figs 1, 7A-D, 9A-D, 11D,E, 14G-M, 16A,F

Ectobius sylvestris (Poda, 1761): Bohn 1989: 322, Figs 1f, 3a-f, 10a-h, 13b,f

Material studied. Switzerland. AG: 1♂, Zeihen, Bözberg, 544 m, 16.VII.[19]67, leg. H. Bachmann (Ba). – 2♂♂, 1♀, 1 L, westl. Ortsende v. Auenstein (bei Lenzburg), 460 m, 15.VI.2002 (He 75); 3 LL, zw. Remigen & Gansingen, 550 m, 15.VI.2002 (He 72); 1♂, Wettingen, 500 m, 14.VI.2002 (He 71) (leg. B. & H. Bohn, HB). – **BE**: 1♂, Bern, 5.VII.[18]96, Dr. Th. Steck; 1♂, Bern, Bremgartenwald, 14.VI.[19]08, Steck; 2♂♂, Bern, Dählhölzli, 29.V.[19]09, Steck; 1♂, Bern, Dählhölzli, 22.VI.1912, Steck; 1♂, Biel, Jura, 500 m, unter Stein, 16.V.[19]25, Dr. Hofmänner; 4♂, Dentenberg, 24.V.1920, Steck; 1♂, Dentenberg, 7.VI.1925, Steck; 1♂, Gümligen, 9.VI.1918, Steck; 3♂♂, Gümligen, 1.VI.1927, Steck; 1♂, Könizbergwald, 16.VI.[19]07, Steck; 1♂, Könizbergwald, 6.VI.[19]09, Steck; 1♂, Könizbergwald, 29.VIII.1926, Steck; 2♂♂, Rüfenacht, 14.VI.1915, Steck; 1♂, Rüfenacht, 27.VII.1919, Steck; 1♂, Wabern, 3.VIII.1919, Steck (Ba). – 9♂♂, 1♀, Bern u. Umgebung; 1♀, Gurten, 24.IX.80; 1♂, Oberscherli, 25.V.[19]56; 1 L, Oberscherli, 30.V.1956; 12♂♂, Oberwil i. S., Schattigseli, 25.VII.1999, leg. H. Baur; 1♂, Reutigenmoos, 12.VI.[19]66; 1 L, Zollikofen, i. Wald, 10.V.[19]31, Montet (Be). – 1♂, [Orvin] (slide Bo 656) (Cf). – 1♂, Steffisburg, 480 m, 23.VI.1983, leg. Baur (Ge). – 1♂, Gadmental, Feldmoos, 1650 m, Tf, 31.VII.1981, Dr. L. Rezbanyai (Lz). – 2 LL, Büren, s.fol.qu.; 2 LL, Büren, II.[18]94 (So). – 4♂♂, 4♀♀, ex L: 2♂♂, 1♀, zw. Orvin & Les Prés d'Orvin, 850 m, 1.VI.2002 (He 58); 1♂, ex L: 1♂, Val de Tavanne, Sorvilier, 700 m, 1.VI.2002 (He 57) (leg. B. & H. Bohn, HB). – **BL**: 1♀, Diegten, Ränggen (SE-Hang: Waldweg), SSE Griessen, 627.175/249.125, 775 m, 31.V.2003, A. Coray; 2♂♂, Liestal, VII.1935, E. Handschin; 1♀, Liestal, Sichteren/Laubi, VI.[19]56, leg. H. P. Straumann; 1♂, Liestal, Laubi, VII.1956, H. P. Straumann; 2♂♂, Pratteln, V.1946, E. Handschin; 1♂, Röserental, 27.VI.1934 (Ba). – 1♂, 1♀, Münchenstein, 18.V.[19]45, Wolf (Zü). – **BS**: 1♂, Riehen, Im Linsberg (südl. Vormbergweg), 400 m, 14.VI.[19]94, A. Coray (Ba). – **FR**: 1♂, Bas Vully, Mont Vully, 8.V.2003, leg. C. Monnerat (Ne). – **GE**: 1♂, Versoix, 24.IX.[19]27, J. de Beaumont (La). – 2♂♂, Vernier, 18.V.[19]21, Frustorfer (Zü). – **GL**: 1♂, Filzbach, Gäsischachen, 19.VI.[19]68; 1♂, Filzbach, Süstli, 30.VI.[19]69 (Zü). – 2♂♂, 2♀♀, Biberlichopf bei Niederurnen, 550 m, 17.VI.2002 (He 87) (leg. B. & H. Bohn, HB). – **GR**: 1♂, V. Mesocco, Mesocco, 30.VI.1923, Steck; 1♀, Plan de Posa [?], Pinus, 31.VII.[19]17; 1♂, Sur, Alp Flix, Gioppas, Südrand, 769.6/155.0, 1955 m, 26.VIII.2002, leg. A. Coray; 1♀, Sur, Alp Flix, Lais Blos; Westrand d. südl. Lais Blos, 769.0/156.1, 1965 m, 26.VIII.2002, leg. A. Coray; 1♂, Trupchun, Arve, 2000 m, 22.VII.[19]47 (Ba). – 2♂♂, Aue bei Reichenau, 1.VI.[19]52; 1♂, Scanfs [S-chanf], 14.VIII.[19]17; 1♂, Scanfs, 15.VIII.[19]18; 1♀, Versam, VII.[18]97; 1♂, Versam, 9.VII.[18]98 (Be). – 1♂, Reichenau, Mähwiese am Rhein, 610 m, 5,VII.[19]60, leg. Nadig (Ge). – 1♂, Scanfs, 15.VII.[19]49, J. de Beaumont (La). – 3♂♂, Davoser Tal, Schia, 1500-1800 m, 24.VII.[19]31, Dr. J. P. Wolf; 1♂, Davoser Tal, 1550-1800 m, 17.VII.[19]39, Dr. Wolf; 1♂, Davoser Tal, 1500-1800 m, 22.VI.[19]40, Dr. Wolf; 1♂, Domleschg, 30.VII.[19]39, Dr. Wolf; 7♂♂, 3♀♀, Filisur, 30.VI.[19]40, Dr. J. P. Wolf (male, slide Bo 277); 1♂, 1♀, Glaris, 1300 m, 19.VII.[19]39, Dr. J. P. Wolf; 1♀, Glaris, Davoser Tal, 1300 m, 17.VIII.[19]38, Dr. J. P. Wolf (slide Bo 658); 1♂, Umg. Parpan, Jochalp, 5.IX.[19]53, leg. W. Sauter; 1♂, Umg. Parpan, Valbella, 9.IX.[19]53, leg. W. Sauter (slide Bo 279); 1♂, Piz Danis, Lenzerheide, 8.VIII.[19]92, Merz (slide Bo 278); 1♀, Samedan, Wiese, 1720 m, 15.VII.[19]86, leg. W. Sauter; 2♂♂, Samedan, Wiese, 20.VII.[19]87, leg. W. Sauter; 1♀, Samedan, Wald, 21.VII.[19]88, leg. W. Sauter (slide Bo 660); 1♀, Valbella/Casoja, Brache, 16.VII.[19]98, leg. B. Merz; 1♂, Zuoz, Sesleriawiese, 19.VII.[19]77, leg. W. Sauter; 1♀, Zuoz, Stipawiese, 1685 m, 22.VII.[19]87, leg. W. Sauter (slide Bo 659) (Zü). – 1♂, ex L: 1♀, Albula-Tal, Surava – Alveneu, 1000 m 23.VI.2001 (He 37); 2♂♂, 2♀♀, 1 L, ex L: 1♂, 1♀, Clavadel (bei Davos), 1630 m, 4.VII.2001 (He 46); 3♂♂, 6♀♀,1 L, ex L: 2♂♂, 3♀♀, Dom-

leschg, Scheid – Feldis, 1400-1500 m, 23.VI.2001 (He 35); 2♂♂, 1♀, 1 L, Filisur, 1080 m, 24.VI.2001 (He 39); 6♂♂, ex L: 1♀, Oberengadin, zw. La Punt & Bever, 1700 m, 24.VI.2001 (male, slide He 40/1); 1♂, 4♀♀, Oberengadin, zw. La Punt & Bever, 1700 m, 6.VII.2001 (He 40a); 4 LL, ex L: 2♂♂, 2♀♀, Oberengadin, Maloja, 1800 m, 24.VI.2001 (He 43); 1♂, 1♀, Oberengadin, Samedan, 1760 m, 5.VII. 2001 (He 51); 9♀♀, 2 LL, ex L: 1♂, 2♀♀, Oberhalbstein, zw. Tinizong & Savognin, 1300 m, 24.VI.2001 (He 44); 1♂, 5♀♀, Somvix, 1000-1200 m, 11.VII.1997 (He 20); 4♂♂, 5♀♀, 2 LL, ex L: 1♀, Val Calanca, Grono – Buseno, 2 km östl. Grono, 600 m, 17.VI.2002 (two males, slides He 80/1,2); 1♀, Valle Mesolcina, Leggia (bei Grono), 17.VI.2002 (He 82) (leg. B. & H. Bohn); 1♂, 1♀, 3 LL, Valser Tal, Marcheggen (bei Vals), 1900 m, VII.2000, leg. T. M. Saks (He 29) (HB). – **JU**: 1 L, Courtedoux, Combe du Pouche, 568.100/252.400, 545 m, TJ2, 20.VII.-3.VIII.1988, Y. Gonseth leg. (Ne). – **LU**: 1♂, Eigental, For[r]enmoos, 970 m, Lf, 7.VII.1983, Dr. L. Rezbanyai; 1♂, Eigental, For[r]enmoos, 965 m, Lf, 18.10.1984, Rezbanyai-Reser; 1♂, 1♀, Eigental, Forrenmoos, 965 m, Tf, 3.VII.1985, Rezbanyai-Reser; 1♂, Hasle, Balmoos, 14.VII.1975, leg. Rézbányai L.; 1♀, Hasle, Balmoos, IX.1975, leg. Rezbanyai; 1♂, Hasle, Balmoos, 970 m, 29.VII.1976, leg. Dr. Rezbanyai-Reser; 1 L, Hasle, Balmoos, 970 m, Tf, 30.V.1977, leg. Dr. Rezbanyai L.; 1 L, Hasle, Balmoos, 900 m, BF, e.VIII. 1977, leg. Dr. Rezbanyai L.; Hasle, Balmoos, 970 m, leg. Dr. Rezbanyai: 1 L, LF, 4.VII.1977, 1 L, 5.IX.1977, 1♂, 1L, TF, 11.IX.1978; 1♀, Luzern, Obergütsch, 550 m, Bf, a.VIII.1977, leg. Dr.Rezbanyai; Neudorf, Vogelmoos, 775 m, Tf, Rezbanyai-Reser: 1♂, 1♀, 10.VII.1987, 1♂, 14.VI. 1988; Romoos (Napf), Mittl. Grämsen, Wiese, 930 m, leg. Dr. L. Rezbanyai-Reser: 1♂, Lf, 2.VI.1993, 1♂, Tf, 7.VI.1993, 1♂, Tf, 25.VI.1993; 1♂, Napfgebiet, Romoos, Änzihüsli bis Ob.Änzi, 639.8-640.8/205.9-206.4, 1250 m, Tf, 17.IX.1997, leg. Dr. L. Rezbanyai-Reser; 1♂, Napfgebiet, Romoos, Neumatt, Altmülibach, 644.6-644.8/207.1-207.4, 680 m, Tf, 2.VII.1997, leg. Dr. L. Rezbanyai-Reser (Lz). – **NE**: 1 L, Champ du Moulin, 27.VIII. [19]41, J. de Beaumont; 1♂, Jura, VIII.[19]51, J. de Beaumont; 1♂, Villaret, 30.V.[19]54, Dr. Hofmänner (La). – 1♂, Neuchâtel (Eremitage), 561.2/205.5, 570 m, clairière prairie méso, 10.VI.1991, J.-P. Haenni; 1♂, Neuchâtel (r. Matile), 561.8/205.5, 550 m, lisière forêt thermophile, 21.VII.1993, JP Haenni; 1 L, Neuchâtel (Matile 77), Grande Cassarde, 561.9/205.5, 545 m,forêt thermophile/lisière, 4.III.1998, JP Haenni; 1 L, Neuchâtel, Matile 77 (maison), 550 m, 28.X.1998, JP Haenni leg.; 1♂, Rochefort (Les Grattes), 552.25/204.1, 1020 m, 20.VI. 1995, JP.Haenni leg. (Ne). – **OW**: 1♂, Alpnachstad, 600 m, 11.VI.[19]38 (Ba). – **SG**: 2♂♂, Vättis, Calfeisental, 15.VII.1930, Steck (Ba). – 1♂, Schänis, Biberlikopf, 3.VI. [19]68 (Zü). – 4♀♀, ex L: 1♂, Altstätten, 550 m, 14.VI.2002 (He 65) (leg. B. & H. Bohn, HB). – **SO**: 3♂♂, 2♀♀, St. Wolfgang bei Balsthal, 600 m, 3.VI.2002 (male, slide He 63/1) (leg. B. & H. Bohn, HB). – **SZ**: Gersau, Oberholz, 550 m, Dr. L. Rezbanyai: 2♂♂, Lf, 28.VI.1979, 1♂, Lf, 13.VI.1980, 6♂♂, Lf, 2.VI.1981, 1♂, Tf, 5.VI.1981, 1♂, Lf, 8.VI.1981, 1♂, Tf, 8.VII.1981, 2♂♂, Lf, 15.VII.1981, 1♂, Tf, 28.VII.1981, 1♂, Lf, 4.VIII.1981, 1♂, Tf, 31.V.1983, 1♀, Tf, 18.VII.1983; 1♀, Gersau, Oberholz, 550 m, BF, XI.1979, leg. Dr. Rezbanyai; 1♀, Gersau, Oberholz, 550 m, BF, VIII.1981, Rezb. & Herger; 1♀, Lauerz, Schuttwald, 480 m, BF, VII.1990, Rezbanyai; Lauerz, Schuttwald, 480 m, Dr. L.Rezbanyai-Reser: 1 L, Tf, 14.V.1991, 4♂♂, 1♀, 5 LL, Tf, 12.VI.1991, 1♂, Tf, 25.VI.1991, 1♂, Lf, 27.VI.1991, 1♂, Lf, 2.VII.1991, 1♀, Tf, 12.VII.1991, 1♂, Tf, 4.VIII.1991; 1♀, Lauerz, Schuttwald, 480 m, Tf, 5.IX.1991, leg. L.Rezbanyai-Reser; 1♂, Rigi-Kulm, 1600-1780 m, Dr. L. Rezbanyai (Lz). – **TG**: 1♀, D[iessen]hofen, 19.X.[19]00, leg. H. Wegelin (slide Bo 651); 1♂, Frauenfeld, 6.VI. [19]01, leg. Wegelin; 1♂, Frauenfeld, 7.VI.[19]02, leg. Wegelin; 1♂, Frauenfeld, 20.VI.[19]06, leg. Wegelin; 1 L, Frauenfeld, 9.X.[19]06, leg. Wegelin; 1♂, Frauenfeld, Stadt, Kantonsschule (Altb), 430 m, 22.VI.2002, leg. H. Blöchlinger; 1♀, Herdern, Schalmenbuck, 19.V.1990, leg. Blöchl.; 1♂, Müllheim, Tobelbach, 430 m, Li, 21.VI.1995, leg. H. Blöchlinger; 2♂♂, Stettfurt (Stapfete), 714.500/265.150, 560 m, 24.V.2000, leg. H. Blöchlinger (Fr). – 1♂, Kreuzlingen, Neuweiher, a. L., 7.VII.[19]69; 1♂, Kreuzlingen, Neuweiher, a. L., 5.VII.[19]70 (Zü). – 1♂, 4♀♀, 1 L, Weinfelden, Schloß, 550 m, 14.VI.2002 (He 67) (leg. B. & H. Bohn, HB). – **TI**: 1♂, San Salvatore, 19.V.1955, F. Keiser (slide Bo 315) (Ba). – 1♀, Curio, X.1953 (slide Bo 654) (Be). – 1♂, Bellinzona, 2.VII.[19]46, J. de Beaumont (La). – 1♂, Castel S. Pietro, Obino, Waldrand, 530 m, LF 11.-20.V.1992, Dr. L. Rezbanyai-Reser (slide Bo 571); 1♂, Lugano, Mt. Brè-Ost [Ca'Gina], 835 m, LF, 21.-30.VI.1986, Rezbanyai-Reser (slide Bo 583); Medeglia-Ost, Val d'Iseo, 718.5/108.1, LF, 700 m, leg. Dr. L. Rezbanyai-Reser: 2♂♂, 21.-30.VI.2000, 1♂, 1.-10.VII.2000, 1♂, 11.-20.VII.2000 (slide Bo 573); 1♂, Meride (Nordwest), Crocifisso, 716.05/84.5, 670 m, Tf, 15.V.1999, leg. L. Rezbanyai-Reser; Meride (West), Fontana, LF, Dr. L. Rezbanyai-Reser: 1♂, 11.-20.V.1992, 1♂, 11.-20.VI.1992, 1♂, 21.-31.V.1993, 1♂, 1.-10.VI.1993, 2♂♂, 11.-20.VI.1993, 2♂♂, 21.-30.VI.1993, 1♂, 11.-20.V.1994 (slide Bo 567),1♂, 21.-31.V.1994, 1♂, 21.-30.VI.1994; 1♂, Meride (West), Fontana, ca. 717.0/83.6, Tagfang, 12.VI.1999, leg. Dr. L. Rezbanyai-Reser; Meride (Ost), S. Antonio, 580 m, LF, Dr. L. Rezbanyai-Reser: 2♂♂, 1.-10.VI.1991, 3♂♂, 11.-20.VI.1991 (male, slide Bo 569), 1♂, 21.-30.VI.1991, 1♂, 11.-20.VII.1991; Meride, Serpiano, Wald, 715.7/85.65, 630 m, LF, Dr. L. Rezbanyai-Reser: 1♂, 1.-10.VI.1995, 2♂♂, 11.-20.VII.1995, 5♂♂, 11.-20.VI.1996 (two males, slides Bo 464, 465), 2♂♂, 21.-30.VI.1996, 2♂♂, 1.-10.VI. 1997, 1♂, 11.-20.VI.1997, 3♂♂, 21.-30.VI.1997; 1♂, Monte Ceneri-Nordseite, Spiano (Contone), 714.9/111.3, 475 m, Lf, 17.VI.1998, leg. Dr. L. Rezbanyai-Reser (slide Bo 584); Tesserete, Gola di Lago, Betuletum, 718.15/107.1, 975 m, Lf, leg. Dr. L. Rezbanyai-Reser: 2♂♂, 9.VII.1999, 1♂, 30. VII.2000 (slide Bo 575) (Lg). – 3♀♀, 10 L, Vellano (bei Giubiasco, Bellinzona), 800 m, 8.VIII.1996 (leg. B. & H. Bohn, HB). – **UR**: 1♂, Meien, 18.VII.[19]44, E. Handschin (Ba). – 1♂, Gigental, Hinter Wang, 686.2/193.7, 1500 m, Tf, 9.VIII.1980, leg. Dr. L. Rezbanyai; 1♂, Hospental, [Südrand, 1500 m,] LF, e.VII.[19]82 [Dr. L. Rezbanyai-Reser] (Lz). – **VD**: 1♂, 1♀, Agiez, VI.[19]55, Cl. Besuchet; 1♀, Belmont, 8.VI.[19]50, J. Aubert; 3♂♂, 5♀♀, 2 LL, Belmont, VI.[19]54, Cl. Besuchet (two females,

slides Bo 671, Bo 672); 5♂♂, 1♀, Belmont, V.[19]55, Cl. Besuchet; 1♀, Entreroches, 8.VI.[19]51, J. Aubert; 1♂, Ferreyres, VI.[19]55, Cl. Besuchet; 3♂♂, Ferreyres, 2.VII. 1971, J. Aubert; 1♀, Flon [?], 23.VIII.[19]42, F. Schmid; 2♀♀, Les Pleiades, 14.IX.[19]41, J.de Beaumont; 1♂, Les Pleiades, 16.VIII.[19]56, J. Aubert; 1♂, Mormont, V.[19]55, Cl. Besuchet; 1♂, Ollon, 29.V.[19]55, Cl. Besuchet; 1♂, Palézieux, 15.VI.[19]43, J. Aubert; 2♂♂, Puidoux, 26. VI.[19]38, J. de Beaumont; 3♂♂, St.Loup, 2 VI.[19]64, J. Aubert; 2♂♂, Vallorbe, 2.VII.[19]44, F. Schmid; 2♂♂, 1♀, Villars/Chamby, 4.VIII.[19]56, J. Aubert; 2♂♂, Vufflens, 6.VI.[19]42; 2♂♂, 1♀, Yverdon, 25.V.[19]55, CL. Besuchet (La). – 5♀♀, Eclépens (bei Sarraz), 550 m, 2.VI. 2002 (He 62) (leg. B. & H. Bohn, HB). **VS**: 1♂, Belenalp, 25.VI.[19]44, E. Handschin (Ba). – 1♂, Hohtenn, VI.[19]63; 1♀, 1 L, Pfinwald, 27.VIII.[19]83 (Be). – 1♂, Valais, Coll. Frey (Ge). – 3♂♂, 1♀, Bois Noir, 15.VI.[19]38, Coll. Cerutti; 1♂, Bourg-St.Pierre, 29.VII.[19]38, Coll. Cerutti; 1♂, B[ourg]-St.Pierre, 18.VIII.[19]38, Coll. Cerutti; 1♂, Grimentz, 24.VI.-8.VII.[19]49; 1♀, Mayens d'Arbaz [= Anobaz?], 14.VIII.[19]42, F.Schmid; 1♀, Praz de Fort, 11.VII.[19]44, F.Schmid; 1♂, Salvan, 21.VI.[19]36, Coll. Cerutti; 3♂♂, 1♀, St. Maurice, V.[19]55, Cl. Besuchet (female, slide Bo 670) (La). – 2♂♂, Val d'Illiez, Le Hazé, pré humide, 9.VII.[19]80, Collection Willy Matthey (Ne). – 1♀, Val d'Entremont, 2 km SE Liddes, 1500 m, 12.VII. 1997 (He 14a) (leg. B. & H. Bohn, HB). – **ZG**: 1♀, Zuger See, Walchwil, 450 m, 17.VI.2002 (He 86) (leg. B. & H. Bohn, HB). – **ZH**: 2♂♂, Dällikon, 15.V.[19]21; 1♀, Illnau, 25.VII.[19]86, leg. W. Sauter; 1♂, Illnau, Schüsselberg, 530-570 m, 13.VI.[19]87, leg. W. Sauter; 1♂, Illnau, Soorhalde, 510 m, 16.VIII.[19]84, leg. W. Sauter; 1♂, Illnau, Soorhalde, 510 m, 14.VIII.[19]87, leg. W. Sauter; 1♂, Illnau, Weid, 560 m, 9.VIII.[19]85, leg. W. Sauter; 1♂, Illnau, Wildert, 519 m, 21.VI.[19]85, leg. W. Sauter; 1♂, Illnau, Wildert, 519 m, 21.VI.[19]89, leg. W. Sauter; 1♂, Meilen; 1♂, Rehalp, 10.VII.[19]26; 1♀, Waltenstein, 600 m, 1.VIII. 1993, leg. Lengwiler; 1♂, Weiningen, 5.VI.[19]21; 1♂, 1♀, Wiesendangen, 23.V.[19]48; 1♂, Zürich, Umgebg. (Zü). – 1♀, Illnau (bei Effretikon), 520 m, 21.VI.1996 (He 10); 3♂♂, 3♀♀, 2 LL, Illnau (bei Effretikon), 520 m, 31.VII. 1996 (two males, slides He 10a/1,2); 1♀, 9 LL, Oberembrach (bei Embrach), 620 m, 30.VII.1996 (He 11); 1♂, 4♀♀, Otelfingen (bei Wettingen), 470 m, 14.VI.2002 (He 70) (leg. B. & H. Bohn, HB). – **XX**: 1♂, Ahlfeld, 30.V. [19]34. E. Handschin (Ba). – 1♂, Spielwald, 8.VI.1929 (Be).

Description

Size. Length of pronotum: ♂ 1.98-2.30 (mean 2.11) mm, ♀ 2.14-2.56 (mean 2.36) mm; length of tegmina: ♂ 9.23-11.05 (mean 9.97) mm, ♀ 4.55-5.85 (mean 5.19) mm. [n = 28♂♂, 37♀♀, from 22 localities in Switzerland]

Colouration. Male: Head. Apart from the often obscured interocular band (and the ocellar spots) completely dark, blackish. Pronotum. Disk hoof-shaped, posterior corners with slight lateral extensions, completely dark (Figs 10g,h). Tegmina. Distinctly and often very darkly mottled, usually with larger dark patches, veinal trunk strongly darkened (Fig. 13b).

Female: Pronotum. Disk hoof-shaped, posterior corners usually with slight lateral extensions, in most cases completely dark, but relatively frequently with reddish brown or ochreous lightenings, but never with a striking yellowish reversed y-shaped marking in the middle (Figs 10a-f). Tegmina. Similar as in male (Fig. 13f). Abdomen. T2-6 lightly coloured margins relatively narrow, no lighter patches in the dark area (Fig. 14G). S2-6 dark area usually at least with two lighter patches, at most with large anterior extensions from the yellow posterior marginal area (Figs 14H,I), but posterior half of sternite never completely yellowish (as occurring in *E. lucidus* and *E. eckerleini*). S7 often completely dark (the two latero-posterior patches excepted), lightenings never as extended as in the species just mentioned, larger dark areas remaining (Figs 14K-M).

Larva (later stages): Never with whitish patches on the metanotum.

Male structures. T6: Transversal ridge with median part slightly bent anteriorly (Fig. 7A), bristles of the tergite surface rather long and strong (Fig. 7D). T7: Glandular pit large, broader than the lateral margins of the segment, fairly rounded; posterior contour line strongly curved throughout (Figs 7B,C). Right paraproct: Medio-anterior arm rather small, distal part very narrow, towards the end still further tapering, curved or angularly bent towards anteriorly (Figs 11D,E). Helmet sclerite: typically helmet-shaped, the well developed neck part angularly set off, helmet in lateral view (dorsal in the animal) fairly isodiametric (Figs 9A-D).

Female genital structures. Basivalvular sclerites long, strongly converging anteriorly (Fig. 16A). Spermathecal plates usually present, sometimes only indicated. Posterior prae-intercalary sclerites narrow, elongated, weakly pigmented (Fig. 16F).

Geographical distribution (Fig. 1). Among the Swiss Blattoptera *E. sylvestris* is the species with the widest distribution; larger gaps in the distribution visible in Fig. 1 are – apart from regions with high mountains – most likely due to collecting gaps. At most localities the species is found quite frequently. At suitable places it can be found together with any of the other species of the group occurring in Switzerland. – The species occurs in all adjacent countries including northern Italy; its distribution reaches as far as to the Ural in the east. Hoebeke & Nickle (1981) reported the establishment of a population of *E. sylvestris* in Genova (New York, USA).

E. lucidus (Hagenbach, 1822)
Figs 2, 7E-H, 9E-H, 11A-C, 14A-F, 16B

Ectobius lucidus (Hagenbach, 1822): Bohn 1989: 322, Figs 1a-d, 2a-k, 3g-k, 4a-h, 7d,e, 11a-i, 12a,b, 13a,e, 16.

Material studied. Switzerland. – **BE**: 1♂, 1♀, Biel, 27.V.1897, Th. Steck; 1♂, Jura, 24.V.1906, Th.Steck; 1♀, Jura, Twann, 26.IX.1895, Steck (Ba). – 2 LL, Beatenberg, 10.IV.1940; 1♀, 1 O, La Neuveville, Le Gibet, W, 573.9/213.3, 590 m, 27.VII.2000, H. Baur; 1♂, 1♀, Ringgenberg, Schurmatta (im Haus)/Fensterbrett, 7.VII.2002, leg. S. Hohler (Be). – 2♂♂, Orvin; 2♀♀, 1 L, Orvin, VIII.1912 (Cf). – 2♂♂, Le Landeron, 580-600 m, 18.VII.1983, leg. Baur; 2♂♂, Orvin, 800 m, 4.VI.1983, leg. Baur (Ge). – 1♂, 2♀♀, 2 LL, Garide, 578/215, 3.V.2003, leg. C.Monnerat (Ne). – 1♂, 5♀♀, Brienzer See, Niederried, 600 m, 15.VI.2002 (male, slide He 78/1); 5♂, 13♀♀, ex L: 5♀♀, Gelterfingen (am Belpberg), 660 m, 15.VI.2002 (male, slide He 76/1); 1♂, 1♀, Liesberg-Station (Laufen – Delémont), 380 m, 1.VI.2002 (male, slide He 56/1); 3♂♂, 7♀♀, 3 LL, ex L: 4♂♂, 6♀♀, zw. Orvin & Les Prés d'Orvin, 850 m, 1.VI.2002 (male, slide He 58/1); 1♂, 5♀♀, Thuner See, zw. Längenschachen & Aeschlen, 700 m, 15.VI.2002 (male, slide He 77/1); 7♂♂, 4♀♀, 1 L, ex L: 6♂♂, 8♀♀, Twann, 500 m, 2.VI.2002 (male, slide He 59/1) (leg. B.&.H.Bohn, HB). – **BL**: 1♂, neotype, Gempen – Stollen, 20.V.1950, E. Handschin; 1♀, Liestal, 20.X.1956, H. P. Straumann (Ba). – 1♀, Schafmatt, 15.VI. (Zü). – **GL**: 2♂♂, 7♀♀, Biberlichopf bei Niederurnen, 550 m, 17.VI.2002 (male, slide He 87/1) (leg. B. & H. Bohn, HB). – **GR**: 2♂♂, 2♀♀, Chur, Jochstrasse, nachts von Vegetation abgesammelt, 759.920/190.610, 605 m, 15.V.2004, leg. U.S.-BNM; 1 L, CH, GR, Malix, Sennereiweg 8, Garten, 759.810/186.730, 120 m, 1.V.2004, leg. U.S.-BNM (Ch). – 1♀, Chur, Fürstenwald, 3.IX.[19]31, Nadig (Ge). – 2♀♀, Davoser Tal, Leidboden b. Wiesen, XI.[19]33, Dr. J. P. Wolf; 9♂♂, 5♀♀, Domleschg, 24./25.V.[19]39, Dr. J. P. Wolf (male, slide Bo 301); 1♂, Filisur, 5.VIII.[19]39, Dr. J. P. Wolf (slide Bo 300); 1♀, Schmitten [bei] Filisur, 1000 m, 4.XI.[19]34, Dr.Wolf; 1♀, Schmitten [bei] Filisur, 18.XI.[19]34, Dr. J. P. Wolf (Zü). – 2♀♀, Albula-Tal, Brienz – Lenz, 1200 m, 23.VI.2001 (He 38); ex L: 1♂, 1♀, Albula-Tal, Surava – Alveneu, 1000 m, 23.VI.2001 (male, slide He 37/1); 1♂, 1♀, 1 L, Chur, 750 m, 30.VI.2002 (male, slide He 91/1); 1♂, 3♀♀, ex L: 1♀, Domleschg, Rothenbrunnen, 700 m, 23.VI.2001 (male, slide He 34/1); 5♂♂, 2♀♀, Domleschg, Scheid, 1050 m, 23.VI.2001 (male, slide He 36/1); 2♂♂, 10♀♀, 1 L, Filisur, 1080 m, 24.VI.2001 (two males, slides He 39/1,2); 2♀♀, Fläsch (bei Bad Ragaz), 550 m, 23.VI.2001 (He 33); ex L: 1♂, Oberhalbstein, zw. Tinizong & Savognin, 1300 m, 24.VI.2001 (slide He 44/1) (leg. B.&.H.Bohn, HB). – **NE**: 1♀, Bevaix, 26.VI.1927; 1 L, Chambrelien, 12.VI.1927 (Cf). – 1 L, Neuchâtel (r. Matile 61), 561.8/205.5, 550 m, lisière de forêt thermophile, 11.-17.II.1990, J.-P. Haenni; 1 L, Neuchâtel (r. Matile 61), 561.8/205.5, 550 m, lisière de forêt thermophile, 18.-24.II.1990, J.-P. Haenni; 1♀, Neuchâtel (r. Matile 61), 561.8/205.5, 550 m, chênaie buissonnante, 22.-29.VII.1990, J.P. Haenni; 1♂, Neuchâtel (r. Matile), 561.8/205.5, 550 m, lisière forêt thermophile, à la lumière, 1.VI.1993, JP Haenni; 1 L, Neuchâtel (Matile 77), Grande Cassarde, 561.9/205.5, 545 m, forêt thermophile/lisière, maison, 20.V.1999, JP Haenni; 1♀, 1 O, Neuchâtel (Matile 77), Grande Cassarde, 561.9/205.5, 545 m, chênaie thermoph./lisière, maison, 7.VI.2002, JP Haenni; 1♂, Rochefort, Château, 551.350/201.750, 780 m, T. Malaise lumineuse, 21.-23.VI.1982, C.Dufour leg.; 1♀, Rochefort, Château, 551.350/201.750, 780 m, T. Malaise lumineuse, 7.-11.X.1982, C.Dufour leg. (Ne). – 3♂♂, 4♀♀, ex L: 1♀, Le Chanet (Le Landeron – Lignières), 620 m, 2.VI.2002 (male, slide He 60/1) (leg. B.&.H.Bohn, HB). – **SG**: 1♀,Tscherlach (bei Walenstadt), 500 m, 17.VI.2002 (He 88) (leg. B. & H. Bohn, HB). – **SO**: 1♀, Soloth. Jura, Flüh, 14.VIII.[19]49, Dr. J. P. Wolf; 1♂, Bas. Jura, Hofstetten, 8.V.[19]45, Wolf (slide Bo 299); 1♂, Soloth. Jura, Hofst[etter] K[öpfli], 8.V.[19]45, Dr. J. P. Wolf; 1♂, Soloth. Jura, Hofst. K., 27.IV.[19]45, Dr. J. P. Wolf; 1♀, Soloth. Jura, 14.VII.[19]46, Dr. J. P. Wolf; 1♂, Landskron, 8.V.[19]49, Dr. J. P. Wolf (Zü). – 7♂♂, 5♀♀, 1 L, ex L: 2♂♂, 6♀♀, Flüeberg bei Flüh (bei Hofstetten), 1.VI.2002 (three males, slides He 55/1,2,3); 1♀, 1 L, St. Wolfgang bei Balsthal, 600 m, 3.VI.2002 (He 63) (leg. B. & H. Bohn, HB). – **SZ**: 1 L, Gersau, Oberholz, 550 m, BF, X.1979, Rezb. & Herger; Gersau, Oberholz, 550 m, Dr. L. Rezbanyai: 1♂, Lf, 14.VIII.1979 (slide Bo 585), 1♀, Tf, 20.X.1981, 1♀, Tf, 10.IX.1982 (Lz). – **TG**: 1♀, Weinfelden, Schloß, 550 m, 14.VI.2002 (He 67) (leg. B. & H. Bohn, HB). – **UR**: 1♂, 14♀♀, 6 LL, Vierwaldstätter See, Sisikon, 550 m, 17.VI.2002 (male, slide He 84/1) (leg. B. & H. Bohn, HB). – **VD**: 1♀, Nyon (in Wohnung), 4.VI.1998, Nr. 143, leg. Hagner SA (Be). – 1♂, Aigle, Weg n. Leysin, 17.VI.[19]27, Dr. Hofmänner (slide Bo 440); 3♂♂, 3 LL, Belmont, VI.[19]54, Cl. Besuchet (male, slide Bo 443); (?) 2 LL, Bois de Belmont, 31.VIII.[19]41, J. de Beaumont; 1♂, Bois de Chênes [?], 15.VII.1969, J. Aubert (slide Bo 454); 1♂, 1♀, Mormont, V.[19]55, Cl. Besuchet (male, slide Bo 442); 1♂, Ollon, 29.V.[19]55, Cl.Besuchet (slide Bo 441); 4♂♂, 6♀♀, Prangins, V.[19]55, Cl. Besuchet (male, slide Bo 458; 2 females, slides Bo 674, Bo 675); 2♂♂, Prangins, 12.VI.[19]55, Cl. Besuchet (two males, slides Bo 459, 461); 2♂♂, Prangins, V.[19]56, Cl. Besuchet (male, slide Bo 460); 1 L, Yverdon, 25.V.[19]55, Cl. Besuchet (La). – 7♂♂, 12♀♀, 1 L, ex L: 1♂, 11♀♀, Chassagne bei Bonvillars (bei Yverdon-les-Bains), 550 m, 2.VI.2002 (male, slide He 61/2); 5♂♂, 8♀♀, ex L: 1♀, Eclépens (bei Sarraz), 550 m, 2.VI.2002 (male, slide He 62/1) (leg. B. & H. Bohn, HB). – **VS**: 1♂, Außerberg, Mili, 17.V.2000, leg. H. Baur; 3♂♂, 3♀♀, 1 L, Fully, Les Follatères, 571.6/108.0, 620 m, 1.V.2003, leg. H. Baur; 1♀, Pfinwald, 19.IV.[19]64; 4♂♂, 1♀, Stalden, 25./27.VI.[19]09, Steck (male, slide Bo 471); 1♀, Zermatt, 27.VIII.[19]16 (Be). – 1♂, Chemin, 2.IX.[19]37, Coll. Cerutti (slide Bo 444); 1♂, Follaterrres, 20.V.1987, R. Delarze; 2♂♂, 1 L, Follaterres, Mayen Loton, 1.VI.1987, R. Delarze (male, slide Bo 483); 1♀, Follaterres, 16.VI.1987, R. Delarze; 1♀, Gueuroz, 31.V.[19]38, Coll. Cerutti; 1♀, Martigny, 10.-24.IX.[19]15, Coll. Cerutti; 1♂, Martigny, 14.VI.1937, Coll. Cerutti; 1♂, Montatuay, 4.VIII.[19]16, Coll. Cerutti, (slide Bo 445); 1♀, Mt. Rosel, 1000 m, 22.VII.1987, R. Delarze; 1♂, 1 L, St. Maurice, V.[19]55, Cl. Besuchet (male slide Bo 457) (La).- Visperterminen, Brachland, Magerwiese, 635.2/122.6, 1300 m, Dr. L. Rezbanyai-Reser: 1♂, Lf, 26.VIII.1995 (slide Bo 586), 1♀, Tf, 10.IX.1995, 1♀, Lf, 12.XI.1995, 1♂, Lf, 16.VII.1997 (slide Bo 587) (Lz). – 1♀, Leuk: Finges, 614.3/129.1, 600 m, zone pionnière, sables, galets, buissons, pins, 9.VIII.1997, JP Haenni (Ne). – 2♂♂, 2♀♀, Valais (So). – 1♂, Wallis, [18?]82, Liniger; 1♂, Leuk – Rotafen, 16.V.1996, leg. Merz & Bächli (slide Bo 499); 1♀, Siders [=Sierre], 26.V.1869; 2♂♂, Visperterminen, 1540 m, 17.VII.1995, leg. B. Merz (male, slide Bo 296), 1♂, 1♀, Visperterminen, 1540 m, 19.VII.1995, leg. B. Merz (male, slide Bo 295); 1♀, Visperterminen, 1520 m, 20.VII. 1993, leg. B. Merz (Zü). – 6♂♂, 11♀♀, ex L: 1♂, 1♀, 1 km WSW Chermignon d'en Bas (bei Sierre), 840 m, 14.VI. 2001 (male, slide He 31/1); 1♂, 4♀♀, Hohtenn, 650 m, 26.V.1996 (He 4); 2♂♂, 4♀♀, Hohtenn, 650 m, 27.V.1998 (male, slide He 4a/1); 2♂♂, 3♀♀, Hohtenn, 900 m, 26.V.1996 (male, slide He 5/2); 2♂♂, 6 LL, ex L: 10♂♂, 3♀♀, Hohtenn, 1100 m, 26.V.1996 (male, slide He 6/1); 9♂♂, 1♀, 6 LL, ex L: 3♂♂, Pfynwald (bei Sierre), 600 m, 25.V.1996 (male, slide He 3/1); 2♀♀, 19 LL, Pfynwald (bei Sierre), 600 m, 6.VIII.1996 (male, slide He 3a); 1♀, Saillon, 500 m, 25.V.1996 (He 1); 2♀♀, 3 LL, Sembrancher (bei Martigny), 800 m, 6.VIII.1996 (He 15); 1♂, 4♀♀, Sierre, Raspille, 550 m, 25.V.1996 (He 2); 6♂♂, 8♀♀, Sierre, Forêt de Finges, 580 m, 27.V.1998 (male, slide He 2a/1); 1♂, 3♀♀, Unterstalden (bei Visp), 900 m, 26.V.1996 (male, slide He 7/2); 1♂, 3 LL, Val de Bagnes, Medières (bei Verbier), 1250 m, 6.VIII.1996 (He 16); 2♂♂, 4♀♀, 4 LL, 2 km E Visp (Visp – Bürchen), 1400 m, 27.V.1998 (male, slide He 28/2); 5 LL, ex L: 2♂♂, Visperterminen, 1450 m, 26.V.1996 (male, slide He 9/3); 2♂♂, 1♀, 8 LL, ex L: 3♂♂, 2♀♀, unterh. Visperterminen, 1100 m, 26.V.1996 (male, slide He 8/2) (leg. B. & H. Bohn, HB). – **ZH**: 4♀♀, L, Dättlikon (bei Winterthur), 460 m, 31.VII.1996 (He 12); 1 L, Freienstein (bei Embrach), 430 m, 31.VII.1996 (He 13) (leg. B. & H. Bohn, HB). – **XX**: 1♀, Hilterf.. [partly unreadable, Hilterfingen?], 11.X.[18]99 (Be). – **France. Dpt. Ain**: 4♂♂, 1♀, Bellegarde-sur-Valserine, 500 m, 12.VI.2001 (male, slide F 101/1); 10♂♂, 8 LL, ex L: 14♂♂, 5♀♀, W slope of Mt. Le Gd. Crêt d'Eau, above Confort (near Bellegarde-sur-Valserine), 750 m, 12.VI.2001 (male, slide F 102/1); 10 LL, ex L: 6♂♂, 2♀♀, W slope of Mt. Le Gd. Crêt d'Eau, above Confort (near Bellegarde-sur-Valserine),1200 m, 12.VI.2001 (male, slide F 103/1) (leg. B. & H. Bohn, HB). – **Dept. Haute Savoie**: 4♂♂, 4 LL, ex L: 8♂♂, 5♀♀, S slope of Mont Salève, above Cruseilles, 850-900 m, 3.VI.2002 (two males, slides F 104/2,5) (leg. B. & H. Bohn, HB). – **Italy. Valle d'Aosta**: 6♂♂, 17♀♀, Valle d'Aosta, W slope of Colle di Joux, Moron, 830 m, 16.VI.2002 (male, slide It 129/1); 4♂♂, 2♀♀, 1 L, ex L: 1♂, 10♀♀, Valle d'Aosta, W slope of Colle di Joux, near Salivod, 1300 m, 16.VI.2002 (It 152); 3 LL, ex L: 2♂♂, 1♀, Valle d'Aosta, W slope of Colle di Joux, Amay, 1500 m, 16.VI.2002 (It 185); 1♂, 1♀, Valle del Gran Bernardo, Eterno, 1660 m, 6.VIII.1996 (male, slide It 85/1); 8♂♂, 12♀♀, ex L: 1 ♀, Valle del Gran Bernardo, Eterno, 1660 m, 6.VIII.1996 (male, slide It 128/1) (leg. B. & H. Bohn, HB).

Description

Size. Length of pronotum: ♂ 2.30-2.56 (mean 2.43) mm, ♀ 2.40-2.94 (mean 2.66) mm; length of tegmina: ♂ 10.27-11.70 (mean 10.97) mm, ♀ 5.92-6.89 (mean 6.41). [n=31♂♂, 39♀♀, from 24 localities of Switzerland]

Colouration. Male: Pronotum. Disk hoof-shaped, posterior corners with slight lateral extensions, from almost completely dark to almost completely lightly coloured, nearly always with a striking yellowish reversed y-shaped marking in the middle (Figs 11h,i, 12a,b). Tegmina. Distinctly mottled, without larger patches; veinal trunk darkened (Fig. 13a).

Female: Pronotum. Similar as in males. Tegmina. Similar as in males but more often with dark patches (Fig.13e). Abdomen. T2-6 with lightly coloured margins rather broad, not seldom with yellow patches within the dark anterior area (Figs 14C,D). S2-6 dark area always with yellow patches or with large extensions from the posterior yellow area, in the extreme up to ⅔ of the sternite yellow (Figs 14E,F). S7 always with extended lightenings, often only the anterior margin and two posterior patches remaining dark (Figs 14A,B).

Larva (late stages): Always with a pair of whitish patches in the middle of the metanotum, which, however, may be obscured in darker animals.

Male structures. T6: Transversal ridge with median part angularly bent anteriorly (Fig. 7E), bristles of the tergite surface short and weak (Fig. 7H). T7: Glandular pit large, considerably broader than lateral margins of the segment, strongly transversal; posterior contour line weakly curved throughout (Figs 7F,G). Right paraproct: Medio-anterior arm rather large, distal part trapezoid to subtriangular, sometimes strongly tapering towards the end and then slightly resembling that in *E. sylvestris*, which, however, has a much shorter and narrower base (Figs 11A-C). Helmet sclerite: higher than broad, neck part small, not well set off (Figs 9E-H).

Female genital structures. Basivalvular sclerites long, anteriorly strongly converging (Fig. 16B). Spermathecal plates missing or, rarely, weakly indicated. Posterior prae-intercalary sclerites broad, ± oval, strikingly dark (Fig. 16G).

Geographical distribution (Fig. 2). The species is widely distributed in Switzerland but is restricted to warm places on southern exposed slopes of hills and mountains. It is completely missing in Tessin and Engadin (southeastern Graubünden) where it is replaced by *E. ticinus* and *E. supramontes*, respectively. Occurring at altitudes between 400 and 1500 m.

E. lucidus is a western European species which is distributed from northern Spain, France, Luxemburg to Germany, Switzerland and Italy. The eastern limits of its distribution are at about a longitude of 10°E in Germany (near Ulm, Bohn 2003) and similarly also in Switzerland. Whether it occurs in Austria remains to be clarified; it was absent in some spot-checks taken at the western border of the country near Landeck and at some localities near Innsbruck known for their thermophilic fauna (Thaler 1985). In northern Italy the species extends eastward along the southern Alps in the north, and along the Apennines in the south. In the southern Alps *E. lucidus* has its eastern limits presumably in the region of Valle d'Aosta at a longitude of about 8° E. In the Apennines it is distributed at least as far as the Abruzzi (Bohn, 1989). Recently, Hoebeke (pers. comm.) has discovered the establishment of a population of this species in New York (USA).

Ectobius eckerleini Harz, 1977

Figs 3, 8A-E, 10A,B, 11F,G, 15A-L, 16G

Ectobius eckerleini Harz, 1977: Bohn 1989: 328, Figs 6e-h, 12c-i, 13c,g

Material studied. Switzerland. – VD: 1♂, Champagne, 17.VI.[19]62, J. Aubert (slide Bo 484); 2♂♂, 2♀♀, Prangins, V.[19]55, Cl. Besuchet (two males, slides Bo 436, 437); 1♂, Prangins, V.[19]56, Cl. Besuchet (slide Bo 438); 1♂, 1♀, Roche, 16.VII.[19]55, Cl. Besuchet (male, slide Bo 439) (La). – 2♂♂, 7♀♀, Chassagne bei Bonvillars (bei Yverdon-les-Bains), 550 m, 2.VI.2002 (male, slide He 61/1) (leg. B. & H. Bohn, HB). – **VS**: 1♀, Saillon – Fully, 31.V.1936, Coll. Handschin (slide Bo 669) (Ba). – 14♂♂, 9♀♀, Fully, Les Follatères, 571.6/108.0, 620 m, 1.V.2003, leg. H. Baur (Be). – 2♂♂, Follaterres, 7.V.1987, R. Delarze (male, slide Bo 455); 1♂, 1♀, Follaterres, 10.VI.1987, R. Delarze (male, slide Bo 456); 1♂, Follaterres, 21.VI. 1987, R. Delarze; 1♀, Martigny, 30.VI.1973, J. Aubert (slide Bo 673); (?) 2 LL, 1.IV.1987, Mt. Rosel, R. Delarze; 1♀, (?) 1 L, Mt. Rosel, 6.V.1987, R. Delarze; 1♀, Mt. Rosel, 22.VI.1987, R. Delarze; 1♀, Mayen Loton, 8.VII.1987, R. Delarze (La). – 1♂, Visperterminen, Brachland, Mager wiese, 635.2/122.6, 1300 m, Lf, 17.VIII.1999, leg. L. Rezbanyai-Reser (slide Bo 588) (Lz). – 1♂, Valais (male, slide Bo 668) (So). – 1♂, Visp, 25.V. (slide Bo 253) (Zü). – 1♂, 2♀♀, 1 km WSW Chermignon d'en Bas (bei Sierre), 840 m, 14.VI.2001 (male, slide He 31/2); 3♂♂, 6♀♀, Mont du Rosel (bei Martigny), 450 m, 26.V.1998 (male, slide He 26/2); 2♀♀, Val d'Entremont, 2 km SE Liddes, 1550 m, 6.VIII.1996 (He 14); 3♂♂, 8♀♀, Val d'Entremont, 2 km SE Liddes, 1500 m, 12.VII.1997 (male, slide He 14a/1); 4♂♂, 8♀♀, 2 LL, 2 km E Visp (Visp – Bürchen), 1400 m, 27.V.1998 (male, slide He 28/3); 1♀, 1 km S Visp, 800 m, 14.VI.2001 (He 32); 12♂♂, 6♀♀, 4 LL, ex. L: 6♂♂, 14♀♀, Visperterminen, 1450 m, 26.V.1996 (four males, slides He 9/1,2,4,5); 1♂, 8♀♀, 2 LL, ex L: 1♂, 2♀♀, unterh. Visperterminen, 1100 m, 26.V.1996 (male, slide He 8/3) (leg. B. & H. Bohn, HB). – **France. Dept. Lozère**: *2♂♂, Mende, 12.VI.56, Cl. Besuchet (two males, slides Bo 485, 486) (La). – **Dept. Hautes-Alpes**: *2♂♂, La Faurie, 3.5 km ENE Agnielles, 1000 m, 7.VI.1994, st.3, Haenni J. P. & Dufour C. (male, slide Bo 665) (Ne). – **Dept. Ain**: 4♀♀, W slope of Mt. Le Gd. Crêt d'Eau, above Confort (near Bellegarde-sur-Valserine), 750 m, 12.VI.2001 (F 102). – **Depts. Drome/Basses-Alpes**: *7♂♂, 8♀♀, 1 L, Col de Pigiere (3 km SE Séderon), 970 m, 29.V.1998 (male, slide F 99/2). – **Dept. Haute-Savoie**: 10♂♂, 22♀♀, ex L: 1♀, S slope of Mont Salève, above Cruseilles, 850-900 m, 3.VI.2002 (three males, slides F 104/1,3,4) (leg. B. & H. Bohn, HB).

Description

Size. Length of pronotum: ♂ 2.11-2.37 (mean 2.20) mm, ♀ 2.24-2.53 (mean 2.38) mm; length of tegmina: ♂ 8.79-10.72 (mean 9.79) mm, ♀ 4.68-5.53 (mean 5.10) mm. [n = 26♂♂, 26♀♀, from 12 localities in Switzerland and France]

Colouration. Male: Pronotum. Disk ± rounded, ochreous or pale ochreous, without or with variously extended brown markings, but never completely dark (Figs 12c-f). Tegmina. Lightly mottled, usually with some rather indistinct patches mainly in the distal ⅓ of the tegmina, veinal trunk quite narrowly darkened (Fig. 13c).

Female: Pronotum. Disk usually almost completely lightly coloured (ochreous to straw-coloured), indistinctly hoof-shaped, with only small dark spots (Figs 12h-i), occasionally with more extended darker markings (Figs 12g, 15C), rarely distinctly hoof-shaped with dark posterior corners (Fig. 15B) or almost completely dark (hazel) (Fig. 15A). Tegmina. Similar as in male, but usually with numerous relatively small dark patches, veinal trunk almost without darkening (Fig. 13g). Abdomen. Very similar to *E. lucidus*. T2-6 with quite broad lightly coloured margins (Figs 15D,E), sometimes with lighter patches in the dark area. S2-6 at least with light patches within the dark area (Figs 15F,G), often posterior ½ of the sternite completely yellow (Fig. 15H). S7 always with lightenings in addition to the two latero-posterior patches, quite often only the anterior margin and two posterior patches remaining dark (Figs 15I-L).

Larva (late stages): Without or with two relatively large fuzzy lighter patches on the metanotum.

Male structures. T6: Transversal ridge with median part moderately bent anteriorly (Fig. 8A); bristles of the tergite surface rather long and strong, the lateral edges of the tergite with densely arranged short but strong bristles giving them the appearance of being serrate (Figs 8D,E). T7: Glandular pit very large, considerably broader than the lateral margins of the segment, broadly transversely oval; posterior contour line forming a rather wide bow with the lateral ends strongly curved anteriorly; along the posterior margin of the pit with unusually long and dense bristles (Figs 8B,C). Right paraproct: Medio-anterior arm similar as in *E. lucidus*, but with a short lateral incision between the proximal and distal part, the latter fairly triangular, often with a striking domelike elevation (Figs 11F,G). Helmet sclerite: extremely high and narrow, almost gutter-shaped, neck part insignificant (Figs 10A,B).

Female genital structures. Basivalvular sclerites long and strongly converging anteriorly (Fig. 16C). Spermathecal plates missing. Posterior prae-intercalary sclerites relatively large and dark, oval or more longitudinal, sometimes quite similar as in *E. lucidus*.

Geographical distribution (Fig. 3). Occurring in southwestern Switzerland in the cantons Waadt and Wallis. Hitherto, the species was only known from the Locus typicus, Montagne de Lure in the Dpt. Basses Alpes in France. This paper contains further reports from the Dpts. Ain, Haute Savoie, Lozère, and Drome/Basses Alpes showing that the species has a more extended distribution also in France. The species can be found together with *E. lucidus* and *E. sylvestris* at the same localities.

Ectobius ticinus, spec. nov.

Figs 3, 4A-E, 5A-M, 8F, 10E-G, 11K, 12A-K, 16A,H

Holotype: ♂, Switzerland, Graubünden, Sta. Maria in Calanca, 950 m, 16./17.VI.2002, leg. B. & H. Bohn (completely on three slides, He 79/1) ZMS.

Additional material. Switzerland. – **GR**: 1♂, bei Castasegna, Bergell, 900 m, 2.VII.1950, E. Sutter (slide Bo 317) (Ba). – 1♂, Bergell, Dr. Killias (slide Bo 652); 1♂, Misox, Dr. Killias (slide Bo 653) (Ch). – 3♂♂, 4♀♀, 1 L, same data as holotype (two males, slides He 79/2,3); 4♂♂, 8♀♀, Val Bregaglia, unterh. Soglio, 900 m, 24.VI.2001 (three males, slides He 41/1,2,3); 2♂♂, 3♀♀, ex L: 1♂, 3♀♀, Val Bregaglia, Soglio, 1200 m, 24.VI.2001 (male, slide He 42/1); 2♀♀, 1 L, ex L: 1♀, Val Calanca, Grono – Buseno, 2 km östl. Grono, 600 m, 17.VI.2002 (female, slide He 80/3) (leg. B. & H. Bohn, HB). – **TI**: 1♂, Novaggio, Val Muggio [?], 5.VIII.[19]56, leg. H. P. Straumann (slide Bo 318) (Ba). – 4♂♂, Mosogno, [V.] Onsernone, 22.VII.[19]62 (male, slide Bo 470) (Be). – Castel S. Pietro, Obino, Waldrand, 530 m, LF, Dr. L. Rezbanyai-Reser: 3♂♂, 11.-20.VI.1991, 3♂♂, 21.-30.VI.1991, 2♂♂, 1.-10.VII.1991, 1♂, 11.-20.VI.1992 (slide Bo 570), 1♂, 21.-30.VI.1992, 3♂♂, 11.-20.VI.1993, 2♂♂, 1.-10.VII.1993; 1♂, Dalpe, Bedrina, Hochmoor/torbiera, 702.5/148.8, 1230 m, Lf, 19.VIII.2000, leg. Dr. L. Rezbanyai-Reser (slide Bo 581); 1♂, Gordevio, [Saleggio,] 300 m, LF, 1.-10.VII.1979, Imhoff & Rezbanyai (slide Bo 582); 1♂, Lugano, Mt. Brè-Ost, [Ca'Gina,] 835 m, LF, 21.-30.VI.1986, Rezbanyai-Reser (slide Bo 580); Medeglia-Ost, Val d'Iseo, 718.5/108.1, 700 m, LF, leg. Dr. L. Rezbanyai-Reser: 2♂♂, 21.-30.VI.2000 (male, slide Bo 572), 2♂♂, 1.-10.VII.2000, 1♂, 1.-10.VIII.2000, 1♂, 21.-31.VIII.2000; 1♂, Meride (West), Fontana, 595 m, LF, 1.-10.VIII.1993, Dr. L. Rezbanyai-Reser (slide Bo 566); 1♂, Meride (Ost), S. Antonio, 580 m, LF, 11.-20.VII.1991, Dr. L. Rezbanyai-Reser (slide Bo 568); Meride, Serpiano, Wald, 715.7/85.65, 630 m, LF, Dr. L. Rezbanyai-Reser: 1♂, 1.-10.VI.1995, 6♂♂, 21.-30.VI.1995, 3♂♂, 1.-10.VII.1995, 2♂♂, 11.-20.VII.1995, 1♂, 21.-31.VII.1995, 2♂♂, 1.-10.VI.1996, 4♂♂, 11.-20.VI.1996, 2♂♂, 21.-30.VI.1996, 4♂♂, 11.-20.VII.1996 (male, slide Bo 562), 1♂, 21.-31-VII.1996, 1♂, 11.-20.VIII.1996, 3♂♂, 1.-10.VI.1997 (male, slide Bo 563); Monte Generoso, Cragno, [Alpe di] Preé, 960 m, LF, Dr. L. Rezbanyai-Reser: 1♂, 11.-20.VI.1994, 1♂, 21.-30.VI.1994, 2♂♂, 11.-20.VII.1994, 1♂, 21.-31.VII.1994 (slide Bo 577); [Monte Generoso,] Cragno, Alpe di Preé, 721.9/84.2, 960 m, LF, Dr. L. Rezbanyai-Reser: 1♂, 21.-30.VI.1995, 2♂♂, 21.-31.VII.1995, 2♂♂, 1.-10.VIII.1996; 1♂, M. Generoso, Cragno, Strada Cragno, 721.0-721.9/84.1-84.4, 860-920 m, Tagfang, leg. Dr. L. Rezbanyai-Reser; M. Generoso, Muggiasca, Costa Stangada, 722.2/85.7, 1060 m, Lichtfang, leg. Dr. L. Rezbanyai-Reser: 1♂, 18.VII.1998 (slide Bo 578), 2♂♂, 2.VIII.1998; 1♂, M. Generoso, Somozza, Scereda, 720.1/83.85, 950 m, Lichtfang, 28.VI.1998, leg. Dr. L. Rezbanyai-Reser (slide Bo 579); 1♂, [M. Generoso,] Somazzo, Toretta (Ost), 590 m, LF, 1.-10.VII.1987, L.Rezbanyai-Reser; 2♂♂, Mt. Generoso, Valle della Giascia, Zoca, Nadelwald, 1040 m, Lf, 11.VII.1994, leg. L.Rezbanyai-Reser; M. Generoso, Valle della Giascia, Zoca, Nadel-Laubmischwald, 720.6/84.4, 1040 m, Lichtfang, leg. Dr. L. Rezbanyai-Reser: 2♂♂, 25.VII.1997, 1♂, 22.VIII.1997, 4♂♂, 28.VI.1998 (male, slide Bo 576), 1♂, 17.VII.1998, 2♂♂, 1.VIII.1998; 1♂, Tesserete, Gola di Lago, Betuletum, 718.15/107.1, 975 m, Lf, 30.VII.2000, leg. Dr. L. Rezbanyai-Reser (slide Bo 474) (Lg). – 1♂, Mairengo, 900 m, T. Malaise lumineuse, 25.VI.-1.VII.1979, C.Dufour, W. Geiger (slide Bo 662) (Ne). – 1 L, Piora, Wiese, 920 m, 24.VII.[19]84, leg. W. Sauter; 1♂, Mergoscia paese, a. L., 3.VII.[19]77 (slide Bo 500) (Zü). – 4♀♀, Bellavista am Südabhang des Mte. Generoso, 1150 m, 30.VI.2002 (female, slide He 89/1); 8♀♀, 2 LL, Mte. Gambarogno, A. di Neggio, 1400 m, 8.VIII.1996 (He 19); 3♂♂, 8♀♀, 2 LL, ex L: 3♂♂, 2♀♀, Mte. Gambarogno, A. di Neggio, 1400 m, 12.VII.1997 (male, slide He 19a/1); 3♂♂, 9♀♀, Südabhand des Mte. Generoso, 1350 m, 30.VI.2002 (male, slide He 90/1); 2♂♂, 4♀♀, Valle Leventina, Faido – Molare, 1000 m, 11.VII.1997 (male, slide He 21/1); 1♀, 1 L, Valle Leventina, Faido – Molare, 1500 m, 11.VII.1997 (female, slide He 22/1); 1♂, ex L: 1♀, Valle Leventina, Faido – Molare, 1300 m, 11.VII.1997 (male, slide He 23/1); 1♀, Vellano (bei Giubiasco, Bellinzona), 800 m, 8.VIII.1996 (female, slide He 18/3); 1♀, Vellano (bei Giubiasco, Bellinzona), 800 m, 11.VII.1997 (He 18a) (leg. B. & H. Bohn, HB). – **VS**: 1♀, Gondo, 8.X.[19]54, Dr. J. P. Wolf (slide Bo 655); 1♀, Gondo, 9.X.[19]54, Dr. J. P. Wolf (Zü). – 4♂♂, 1♀, 4 LL, ex L: 3♂♂, Gondoschlucht, Gabi, 1250 m, 13.VI.2003 (male, slide He 92/1) (leg. B. & H. Bohn, HB). – **Italy. Piemonte**: 4♂♂, 2♀♀, 10 LL, ex L: 7♂♂, 5♀♀, Arvogno (N Santa Maria Maggiore, Val

Vigezzo), 1250 m, 13.VI.2003 (male, slide It 173/1); 5♂♂, 1 L, ex L: 1♀, Finero (5 km SE Malesco, Val Vigezzo), 850-950 m, 12.VI.2003 (male, slide It 172/1); 13♂♂, 18♀♀, 5 LL, ex L: 1♂, 2♀♀, Lago Maggiore, 4 km NW Cheggio/ Trarego-Viggione (NW Cannero), 1200 m, 12.VI.2003 (male, 4 females, slides It 170/1-5); 2♂♂, 5♀♀, Lago Maggiore, Pian d'Arla (2.5 km W Il Colle, W Cannero), 1300 m, 12.VI.2003 (male, slide It 171/1); 14♂♂, 12♀♀, 13 LL, ex L: 2♂♂, 4♀♀, Panorama Zegna (N Biella), Bochetta di Stavello, 1200 m, 14.VI.2003 (male, slide It 180/1); *11♂♂, 8♀♀, 3 LL, Panorama Zegna (N Biella), Bochettina Sessera, 1400 m, 15.VI.2003 (male, 2 females, slides It 181/ 1-3); 7♂♂, 16♀♀, 2 LL, O, Passo La Colma (10 km E Varallo), 940 m, 14.VI.2003 (male, slide It 177/1); 11♂♂, 14♀♀, 12 LL, O, ex L: 2♂♂, 2♀♀, Val di Antrona, btw. Antronapiana & Cheggio, 1150 m, 13/14.VI.2003 (male, slide It 175/1); 3♂♂, ex L: 3♂♂, 4♀♀, Val di Antrona, Cheggio, 1500 m, 14.VI.2003 (male, slide It 176/1); 2♂♂, 5♀♀, 7 LL, ex L: 1♀, Val Formazza, 3 km N Foggiano, 1150 m, 13.VI.2003 (male, slide It 174/1); 3♂♂, 7♀♀, O, Valsesia, Balmuccia, 500 m, 14.VI.2003 (male, slide It 179/1); 14♂♂, 5♀♀, 17 LL, ex L: 4♂♂, 2♀♀, Valsesia, Rima, 1400 m, 14.VI.2003 (male, female, slides It 178/ 1-2) (leg. B. & H. Bohn, HB).

Etymology. The species is named after the river Ticino, the drainage area of which is the center of its distribution.

Description

Size. Length of pronotum: ♂ 2.11-2.50 (mean 2.31) mm, ♀ 2.24-2.75 (mean 2.52) mm; length of tegmina: ♂ 10.27-12.28 (mean 11.39) mm, ♀ 5.07-6.50 (mean 5.90) mm. [n = 44♂♂, 39♀♀, from 24 localities in Switzerland and Italy]

Colouration. Male: Pronotum. Disk hoof-shaped, posterior corners with slight lateral extensions, from almost completely dark brown, with only minimal lightenings, to almost completly lightly coloured (ochreous), usually with quite contrasting pattern (Figs 5A-D). Tegmina. Distinctly and often rather darkly mottled, rarely with larger patches, veinal trunk strongly darkened (Fig. 4A). Abdomen. Tergites rather dark, posterior lightenings often quite narrow, median light longitudinal band often rather distinct, causing a very contrasting colouring especially on T7 (Fig. 5H).

Female: Pronotum. Disk hoof-shaped, posterior corners usually with slight lateral extensions, but sometimes also without (Fig. 12D), completely dark brown or variously lightened to a rather contrasting pattern, often with a striking yellowish reversed y-shaped marking in the middle of the disk (Figs 12A-E). Tegmina. Similar as in male, but more often with larger patches and often darker (Figs 4C,D). Abdomen. T2-6 with rather narrow lightly coloured margins, no other lightenings. S2-6 similar to tergites, lightening at posterior margin often indistinct or missing. S7 often without lightenings except at latero-posterior margins, at the most about ½ of the surface lightened (Figs 12H-K). Characteristic in minimally lightened specimens is a pair of light patches near the anterior apodemes, not found in other species (arrow in Fig. 12I).

Larva (late stages): Always with a pair of whitish patches in the middle of the metanotum (Fig. 16K).

Male structures. Tegmina usually surpassing the abdomen considerably. T6: Transversal ridge with median part weakly bent anteriorly, bristles of the tergite surface rather long and strong (Figs 5F, 8F). T7: Glandular pit in shape similar as in *E. sylvestris*, but considerably smaller, not broader than the lateral margins of the tergite, in outline fairly rounded; posterior contour line strongly curved throughout (Figs 5G-K). Right paraproct: Medio-anterior arm lightly pigmented, proximal part rather narrow, separated laterally by a deep incision from the distal part, which forms a long, gradually tapering tongue with cut (Fig. 11K) or more acute tip. Helmet sclerite: not helmet-shaped, forming a low, flat mound, ± oval in outline (Figs 10E-G). Phallomeres: Not differing remarkably from other species of the group. Right phallomere with interconnected R3 and cleft sclerite (Fig. 10E). Left phallomere with endophallus apodeme and hook (for the natural arrangement and orientation of the phallomeres see Fig. 1b). Hook consisting of a long shaft with a trough over its full length, a short stalk, and a claw with a well developed membraneous velum (Figs 5L,M).

Female genital structures. Basivalvular sclerites relatively short, not strongly converging anteriorly (Fig. 16D). Spermathecal plates missing. Posterior prae-intercalary sclerites relatively large, oval or rectangular, not strikingly dark (Fig. 16H).

Geographical distribution (Fig. 3). Distributed in the southern Alps in between Valle d'Aosta and Lake Como, at altitudes of 300-1400 m. In Switzerland mainly occurring in Tessin but touching also Wallis at its eastern border (near Gondo) and Graubünden (Grisons) at its western border (valleys of Mesocco and Bergell). In the eastern part of its distribution area, mainly in Tessin, there is some overlapping with the distribution area of *E. sylvestris*; both species can be found together at the same localities.

Ectobius supramontes, spec. nov.

Figs 3, 4F-K, 6A-M, 8G, 9C,D, 11H,I, 13A-K

Holotype: ♂, Switzerland, Graubünden, Unterengadin, zw. Scuol & Ftan, 1430 m, 5.VII.2001, leg B. & H. Bohn (completely on 3 slides, He 49/2) ZSM.

Additional material. Switzerland. – GR: 1♂, S.N.P., Il Fuorn, Laborfenster, Licht, 1800 m, 26.VIII.[19]63, W. Eglin (slide Bo 319); 1♂, Schuls, Straße nach Fetan, Handschin (slide Bo 316) (Ba). – 2♀♀, S.N.P., Ardez, Steinsberg, 1525 m, 16.VIII.[19]34, Dr. Hofmänner (female, slide Bo 646); 1♀, S.N.P., Fuorn, a. Piceazapfen, 16.VIII.[19]34, Dr. Hofmänner (slide Bo 648); 1♂, S.N.P., Larscheida, 1800 m, Wiesen, 17.VIII.[19]34, Dr. Hofmänner (slide Bo 645); (?) 2 LL, S.N.P., Livignoweg, Scheitel, 1800 m, unt. Nadeln, 14.VIII.[19]34, Dr. Hofmänner; 1♀, O, S.N.P., Praspöl, 1695 m, Wiesen, 23.VIII.[19]27, Dr. Hofmänner (slide Bo 647); 1♀, S.N.P., V. Cluozza, 1900 m, unt. Legföhre, 21.VIII.[19]38, Dr. Hofmänner (slide Bo 649); 1♀, Tarasp, Dr. Killias (slide Bo 644) (Ch). – 1♀, Sta. Maria, Münstertal, 15.IX.[19]30, Nadig (slide Bo 650) (Ge). – 1♂, Il Fuorn, 20.VII.[19]49, J. de Beaumont (slide Bo 449); 1♀, Il Fuorn, VI.[19]52, J. Aubert; 1♂, P.N., Val Fruz [?], 15.VII.[19]51, J. Aubert (slide Bo 450); 1♂, Pradatsch, V. Scarl, 18.VIII.[19]51, J. Aubert (slide Bo 448); 1♂, Val Sesvenna, 1900 m, 19.VIII.[19]55, Cl. Besuchet (slide Bo 447) (La). – 1♂, 1♀, Val Müstair, Lü, Nordwestrand (Lü Daint), 823.8/168.2, 1950 m, Lf, 13.VIII. 1999, leg. Dr. L. Rezbanyai-Reser (male, slide Bo 589) (Lz). – 3♂♂, Samedan, Wiese, 1860 m, 19.VII.[19]88, leg. W. Sauter (2 males, slides Bo 297, 788); 1♂, Samedan, Geröll, 1830 m, 20.VII.[19]88 (slide Bo 249); 1♀, Samedan, Steppe, 1720 m, 19.VII.1989, leg. W. Sauter (slide Bo 661) (Zü). – 1♂, 4♀♀, 3 LL, ex L: 2♂♂, Il Fuorn, 1820 m, 5.VII.2001 (male, slide He 47/1); ex L: 1♂, 1♀, Oberengadin, zw. La Punt & Bever, 1700 m, 24.VI.2001 (male, slide He 40/2); 2♂♂, 2♀♀, Unterengadin, Martina, 1060 m, 5.VII.2001 (male, slide He 48/1); 7♂♂, 11♀♀, same data as holotype (three males, slides He 49/1,3,4); 7♂♂, 6♀♀, 2 LL, ex L: 4♀♀, Unterengadin, Susch, 1480 m, 5.VII.2001 (male, slide He 50/1); 3♂♂, 6♀♀, 1 L, Val Poschiavo, Piazzo, 950 m, 6.VII.2001 (male, slide He 52/1) (leg. B. & H. Bohn, HB). – **Italy. – Lombardia**: 1♂, Mte. Legnone, W-Grat, 1550 m, 23.VII.[19]63, leg. Nadig, Coll. Harz (slide Bo 598) (Ge). – *1♂, Mte. Pari [= Cima Pari, near Riva del Garda ?], Tirol.m. (slide Bo 597) (Sammlung KOFLER). – 10♂♂, 4♀♀, 2 LL, Alpi Orobie, SE slope of Passo di S. Marco, 1530 m, 29.VI.2002 (male, slide It 140/1); 21♂♂, 15♀♀, 20 LL, ex L: 6♂♂, 6♀♀, Alpi Orobie, 2 km ENE Passo del Vivione (Malonno – Schilpario), 1700 m, 29.VI.2002 (male, slide It 135/1); 2♂♂, 4♀♀, Alpi Orobie, Ronco (Schilpario – Barzesto), 1100 m, 29.VI. 2002 (male, slide It 136/1); 9♂♂, 9♀♀, 'Bergamo', Passo della Crocetta (Gorno – Serina), 1250 m, 29.VI.2002 (male, slide It 138/1); 3♂♂, 7♀♀, 5 LL, Isolaccia/Valdidentro (near Bormio), 1350 m, 3.VII.2003 (male, slide It 186/1); *1♂, 1♀, 4 km SW Passo di Nota (W Lago di Garda), 950 m, 28.VI.2002 (male, slide It 130/1); 8♂♂, 10♀♀, 14 LL, ex L: 1♂, 6♀♀, Passo della Foppa (Grosio – Monno, NE Edolo), 1800 m, 3.VII.2003 (male, 4 females, slides It 188/1-5); *3♂♂, 1♀, 6 LL, ex L: 1♂, 2♀♀, 2 km WNW Passo di Nota (W Lago di Garda), 1350 m, 28.VI.2002 (male, slide It 131/1); 10♂♂, 2♀♀, Poiro (near Civo, Morbegno), 1100 m, 6.VII.2001 (male, slide It 127/1); 1♀, 5 LL, ex L: 4♀♀, 2 km E Ponte di Legno (NE Edolo), 1600 m, 4.VII.2003 (female, slide It 189/1); 6♂♂, 7♀♀, Valtellina, Fusino (NW Grosio), 1200 m, 3.VII.2003 (male, slide It 187/1); 1♂, 1♀, Val Camonica, btw. Astrio & Prescarzo (near Breno), 700 m, 28.VI.2002 (male, slide It 134/1); 5♂♂, 5♀♀, 3 LL, Valle del Caffaro, 1 km NNE Valle Dorizzo, 1250 m, 28.VI.2002 (male, slide It 133/1) (leg. B. & H. Bohn, HB). – **Trentino-Alto Adige**: *9♂♂, ex L: 3♂♂, S slope of Monte Penegal (near Bozen), 1600 m, 4.VII.2003 (male, slide It 191/1); *2♂♂, 4♀♀, 3 LL, Schnalstal, Vernagt Stausee, 1700 m, 4.VII.2003 (male, slide It 192/1); *1♀, Val d'Algone, 800-900 m, 20.VII. 2003 (female, slide It 202/1); *1♂, Val d'Ambiez, 850 m, 20.VII. 2003 (slide It 201/1); *1♂, 7♀♀, 2 LL, O, Val di Sole, btw. Castello & Menas (WSW Malè), 1400 m, 4.VII.2003 (male, slide It 190/1) (leg. B. & H. Bohn, HB). – **Austria. Tirol**: 1♂, Serfaus, 1500 m, 2.VII.2003 (slide A 58/1) (leg. B. & H. Bohn, HB).

Etymology. The species name refers to its occurrence high up in the mountains.

Description

Size. Length of pronotum: ♂ 2.05-2.34 (mean 2.19) mm, ♀ 2.14-2.56 (mean 2.39) mm; length of tegmina: ♂ 7.41-9.88 (mean 9.11) mm, ♀ 4.62-5.85 (mean 5.23) mm. [n = 39♂♂, 35♀♀, from 16 localities in Switzerland and Italy]

Colouration. Male: Pronotum. Disk more or less rounded or with only indicated posterior corners, usually lightly coloured (orange-ochreous) with weak and small darker markings, rarely with extended and strong darkenings, as a rule much lighter coloured than *E. ticinus* (Figs 6A-D). Tegmina. Lightly mottled, without larger patches, veinal trunk moderately darkened (Fig. 4F).

Female: Pronotum. Disk hoof-shaped, posterior corners without lateral extensions, often completely dark or variously lightened, usually with less contrasting pattern than in *E. ticinus*. Tegmina. Distinctly mottled, often with larger patches, veinal trunk strongly darkened (Figs 4H,I). Abdomen. T2-6 with rather narrow lightly coloured margins, no other lightenings. S2-6 similar to tergites, lightening at posterior margin often missing. S7 often without lightenings except at latero-posterior margins, at most with not much more than about ½ of the surface lightened (Figs 13H-K). Characteristic in specimens with lightened T7 are the whitish anterior apodemes and surroundings, not found in other species (arrows in Figs 13H-K).

Larva (later stages): Usually without (Fig. 16L), but exceptionally also with a pair of small whitish patches in the middle of the metanotum.

Male structures. Tegmina shorter than in *E. ticinus*, sometimes scarcely reaching the end of the abdomen. T6: Transversal ridge with median part only weakly bent anteriorly (Fig. 6F); bristles of the tergite surface rather long and strong (Fig. 8G). T7: Glandular pit distinctly transversal, broader than lateral margins of the tergite; posterior contour line usually forming a wide bow, with the lateral ends rather strongly curved anteriorly (Figs 6G-K). Right paraproct: Medio-anterior arm similar as in *E. ticinus*, but distal part shorter, triangular to crescent-shaped with an acute tip. Helmet sclerite: not helmet-shaped, forming a low and flat mound, fairly oval in outline (not different from *E. ticinus*) (Figs 10C,D). Phallomeres: Similar as in *E. ticinus* (Figs 6L,M).

Female genital structures. Basivalvular sclerites as in *E.ticinus* relatively short, not strongly converging anteriorly (Fig. 16E). Spermathecal plates missing. Posterior prae-intercalary sclerites narrower than in *E. ticinus*, elongated (Fig. 16I).

Remarks. In some cases the differences in the shape of the glandular pit between *E. ticinus* and *E. supramontes* may not be as clear as shown in Figs 5G,H and 6G,H; the two species also show some overlap in the size of the pits (Tab. 1). In these cases consideration of additional features such as are length of tegmina and structure of the right paraproct should allow an unequivocal determination.

Geographical distribution (Fig. 3). In Switzerland the species is restricted to the southeastern part of Graubünden, the Engadin, along and south of the river Inn. In the valley of the Inn it also reaches Austria (near Serfaus). The species has its widest distribution in the southern Alps of Italy reaching from Lake Como in the west up to the river Adige in the east, including also the Vinschgau (Schnalstal). *E. supramontes* is a high montane species inhabiting altitudes between 700 m and 1900 m; it is rarely found below 1000 m. – At the northern and eastern borders of its distribution there is a narrow zone of overlapping with the distribution area of *E. sylvestris* where both species may be found together at the same localities.

Discussion

The glandular pit of T7 in males has – since Ramme's pioneering work (1923) successfully continued and improved by Failla & Messina (1978) – turned out to be an indispensible means for the discrimination of *Ectobius* (and *Phyllodromica*) species. In the *sylvestris*-group, unfortunately, the differences in the structure of the pit are rather small. The great morphological similarities on the one hand, and the high variability in colouration on the other hand make the discrimination of the species of this group even in the male quite difficult, not to speak of the still much more problematic females.

The discovery of additional distinguishing features – such as the helmet sclerite and the paraprocts in males and the genital sclerites and colouration in females – now allow a very reliable determination of males and, in most cases, also of females. Moreover, comparison of the structures mentioned also allow conclusions about the phylogenetic relationships of the species. The various shapes of the helmet sclerite can be arranged quite well in a continuous series suggesting the following relationships: *sylvestris* + (*lucidus* + (*eckerleini* + (*ticinus* + *supramontes*))). The possession of some kind of a spermathecal plate in *E. sylvestris* can be considered as a primitive character. The sister group relationships of the last three taxa also get support from the structure of the right paraproct: the medio-anterior arm has a lateral incision, short in *E. eckerleini*, much deeper, however, in *E. ticinus* and *E. supramontes*. The similarities in the shape of the basivalvular sclerites may be considered as another synapomorphy of the latter two species. These preliminary conclusions, of course, need confirmation by a more extended cladistic analysis including also the Iberian species and all available structures.

The distribution of the species is in good agreement with the assumed relationships. *E. sylvestris* inhabits almost the whole Europe north of the latitude of about 45° (with the exception of the British Isles and possibly also of Norway). *E lucidus* is a more southern and western species reaching not further than to the longitude of 10° in the west (eastern end of Lake Constance). The distribution of the other species is still more restricted. The areas of *E. eckerleini*, *E. ticinus* and *E. supramontes* follow each other from the west to the east. This sequence might reflect the direction of a former spreading in connection with a splitting of species.

The distribution of some of the species of the *sylvestris*-group is remarkable: *E. lucidus*, *E. ticinus* and *E. supramontes* have separate distribution areas, and the same is also true for *E. eckerleini* and the latter two species. The distances between the adjacent areas is not very great. Considering the restricted mobility of the species in which only the males are able to fly, and the geographic situation in the regions in question with chains of high mountains as effective migration barriers, the occurrence of several species in separate areas should not be astonishing. Seemingly unsurmountable altitudes, indeed, separate the areas of *E. eckerleini* and *E. ticinus*

(Simplon, Nufenen and Furka Pass) as well as those of *E. lucidus* and *E. supramontes* (Julier, Albula and Flüela Pass). But slightly more to the south no such geographical barriers can be found between the areas of *E. lucidus* and *E. ticinus*, and between those of *E. ticinus* and *E. supramontes*.

One might ask whether the separation of the species is maintained by interspecific competition which does not allow their coexistence at one place. On the other hand, other species of the group can obviously coexist quite well. *E. sylvestris*, for example, may be accompanied by any of the other four species, especially frequently by *E. lucidus*: very often – in Switzerland as well as in Germany – the two species can be found together at the same locality.

The separation of the distribution areas as it appears now might, however, be a sampling artefact. The localities, especially in northern Italy, are not that densely arranged to exclude the possibility of an overlapping of the areas. Much more sampling has to be done to clarify the distribution of the species of this group in Italy, but also in southern France and in Austria.

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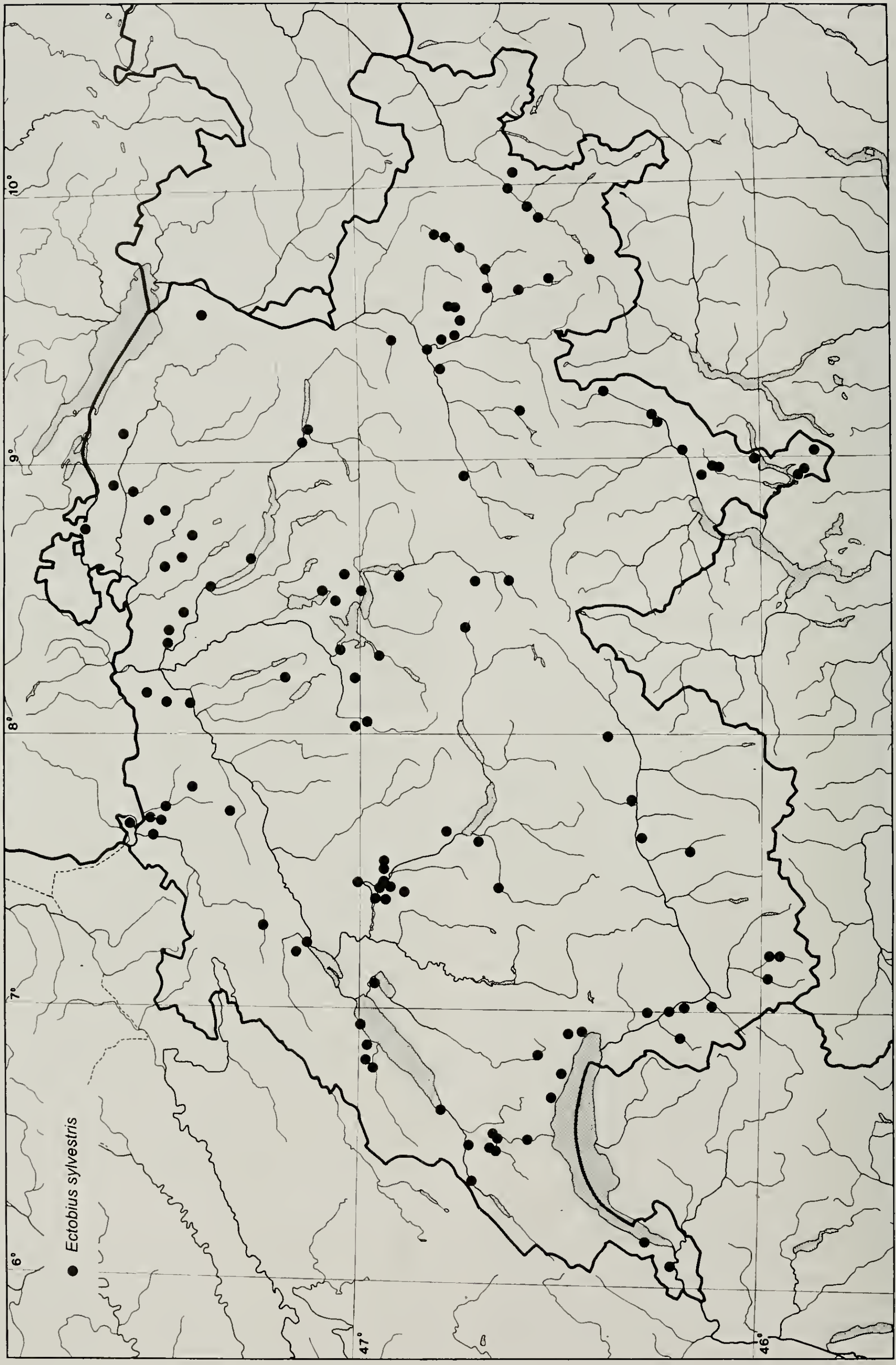

Fig. 1. Distribution of *E. sylvestris* in Switzerland.

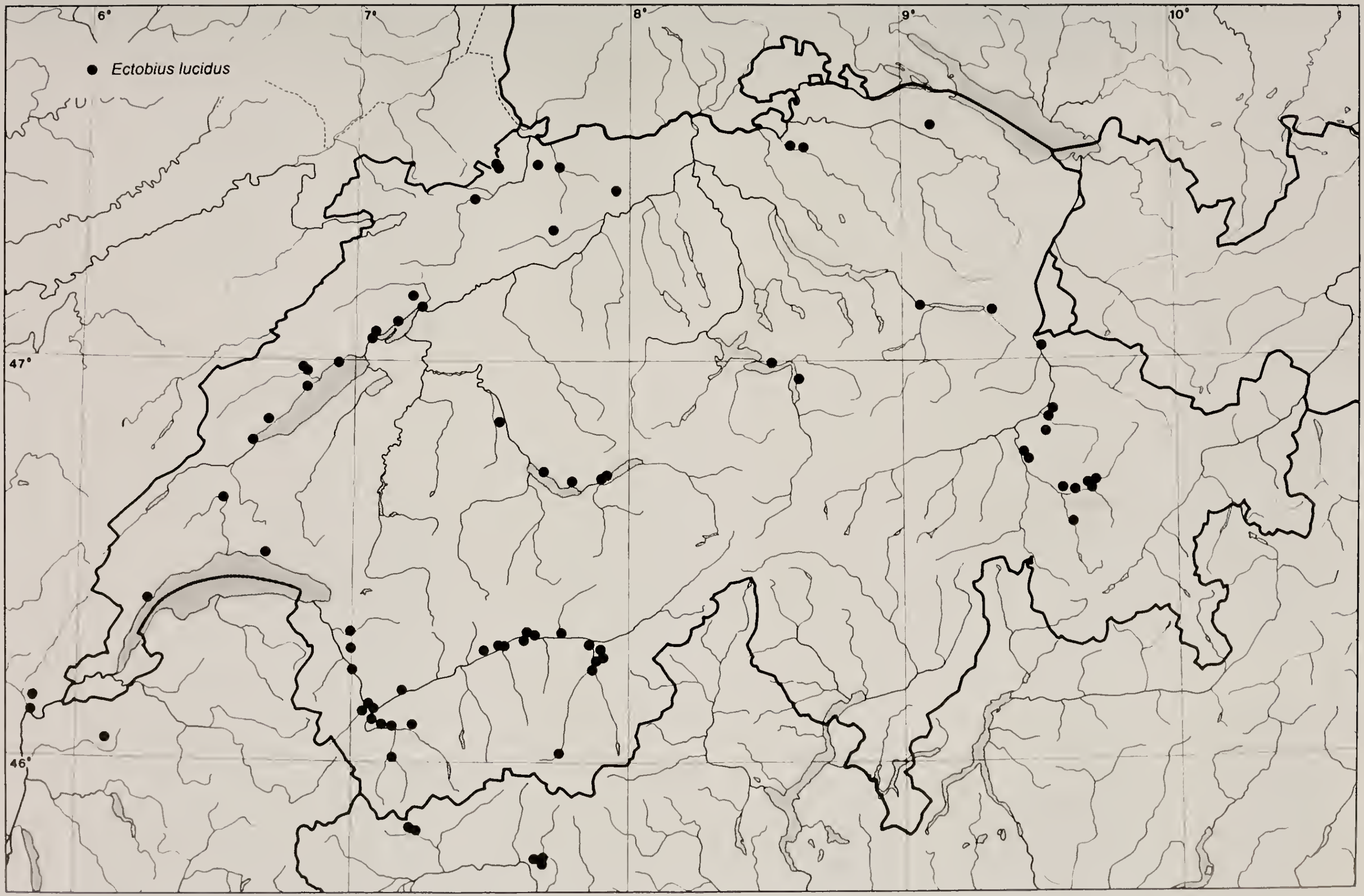

Fig. 2. Distribution of *E. lucidus* in Switzerland and in the adjacent southern parts of France and Italy. In France collecting was done only at the localities labeled; the species may be distributed throughout the area depicted. In Austria *E. lucidus* has not yet been found; for its distribution in Germany see Fig. 2 in Bohn (2003).

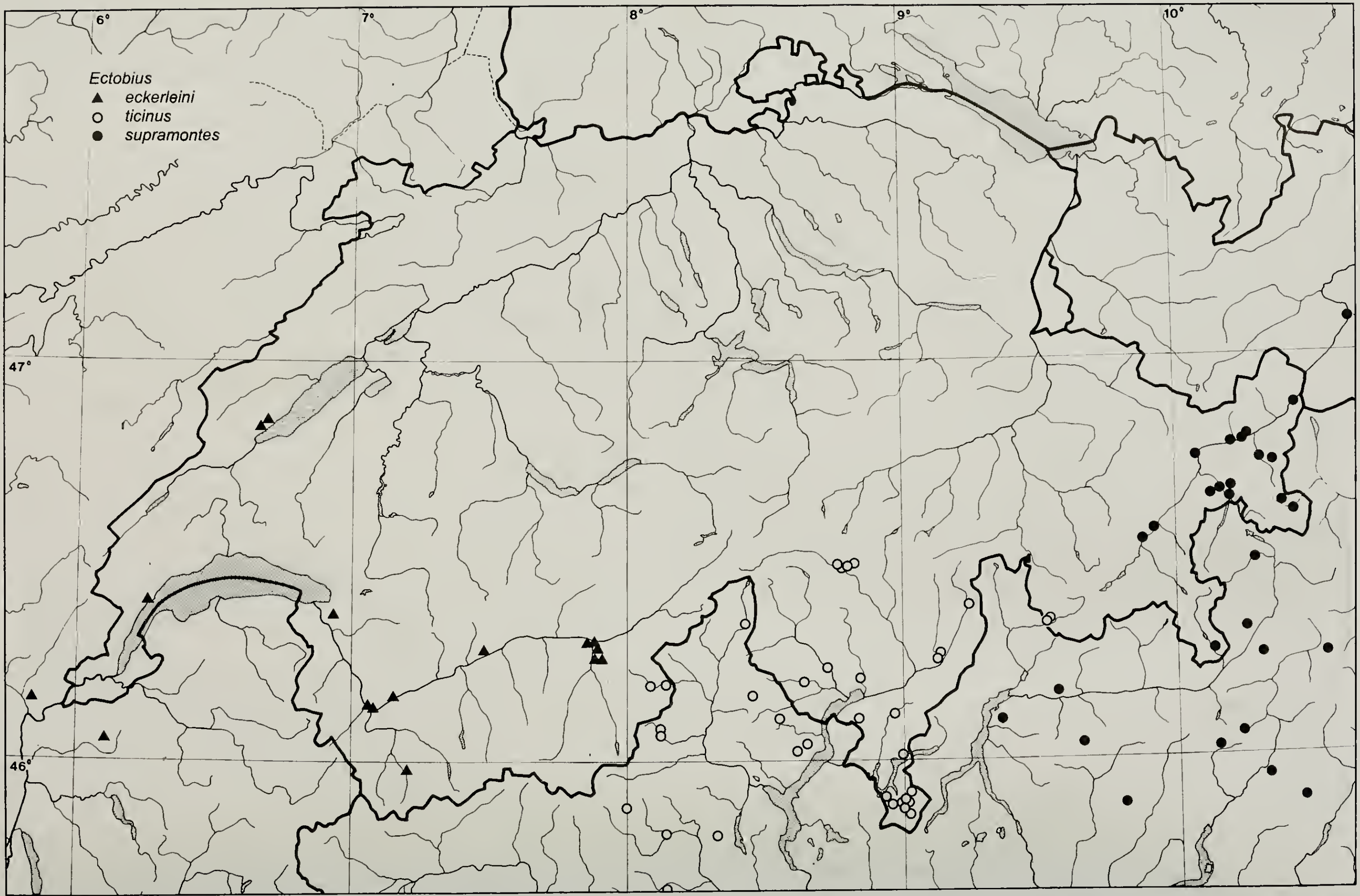

Fig. 3. Distribution of *E. eckerleini*, *E. ticinus* and *E. supramontes* in Switzerland and the adjacent southern regions of France, Italy, and Austria. *E. eckerleini* might have a more extended distribution in France, especially south of Lake Lemon. The distribution of *E. supramontes* in the east reaching as far as Lake Garda and the river Adige, including the Vinschgau.

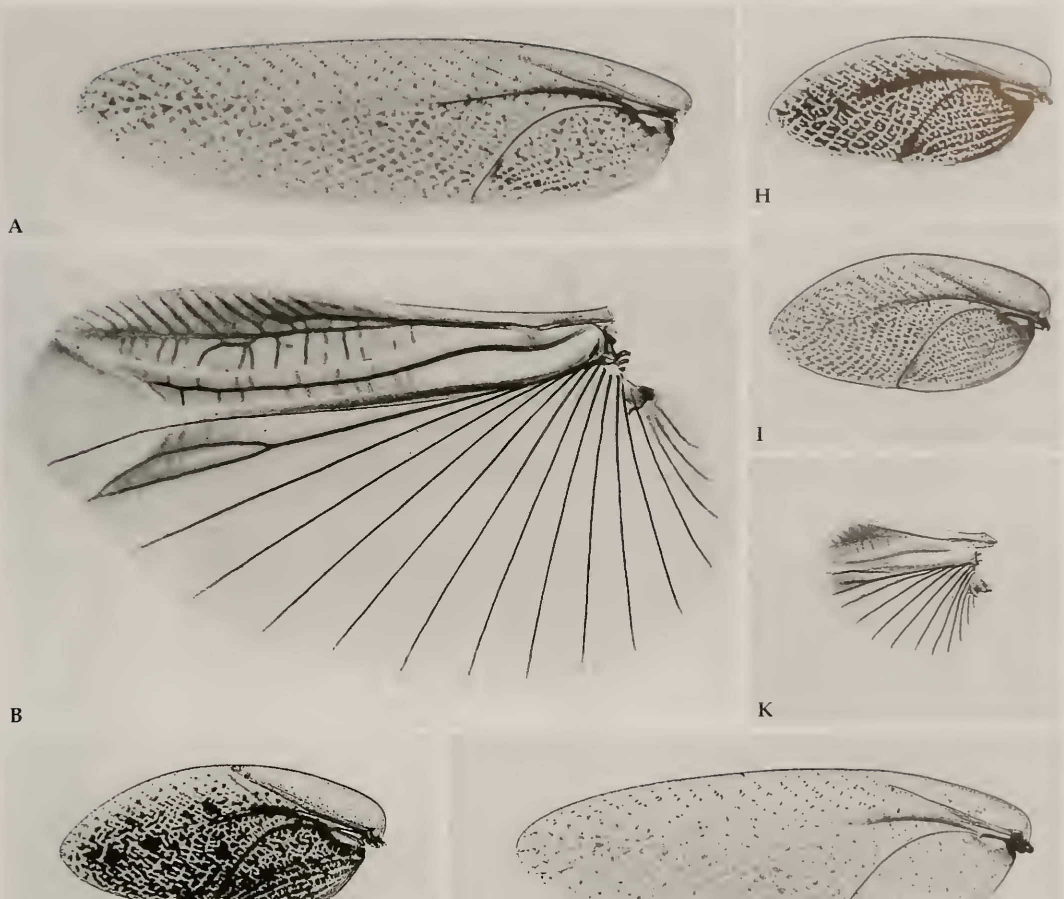

Fig. 4. Wings of the new species. **A-E.** *E. ticinus.* **F-K.** *E. supramontes.* Males (**A, B, F, G**), females (**C-E, H-K**), tegmina (**A, C, D, F, H, I**), hind wings (**B, E, G, K**). Same scale for all figures. Identification: He 79/1, holotype (**A, B**), It 170/4 (**C, E**), It 170/5 (**D**), He 49/2, holotype (**F, G**), It 189/1 (**H**), It 188/4 (**I**), It 188/2 (**K**).

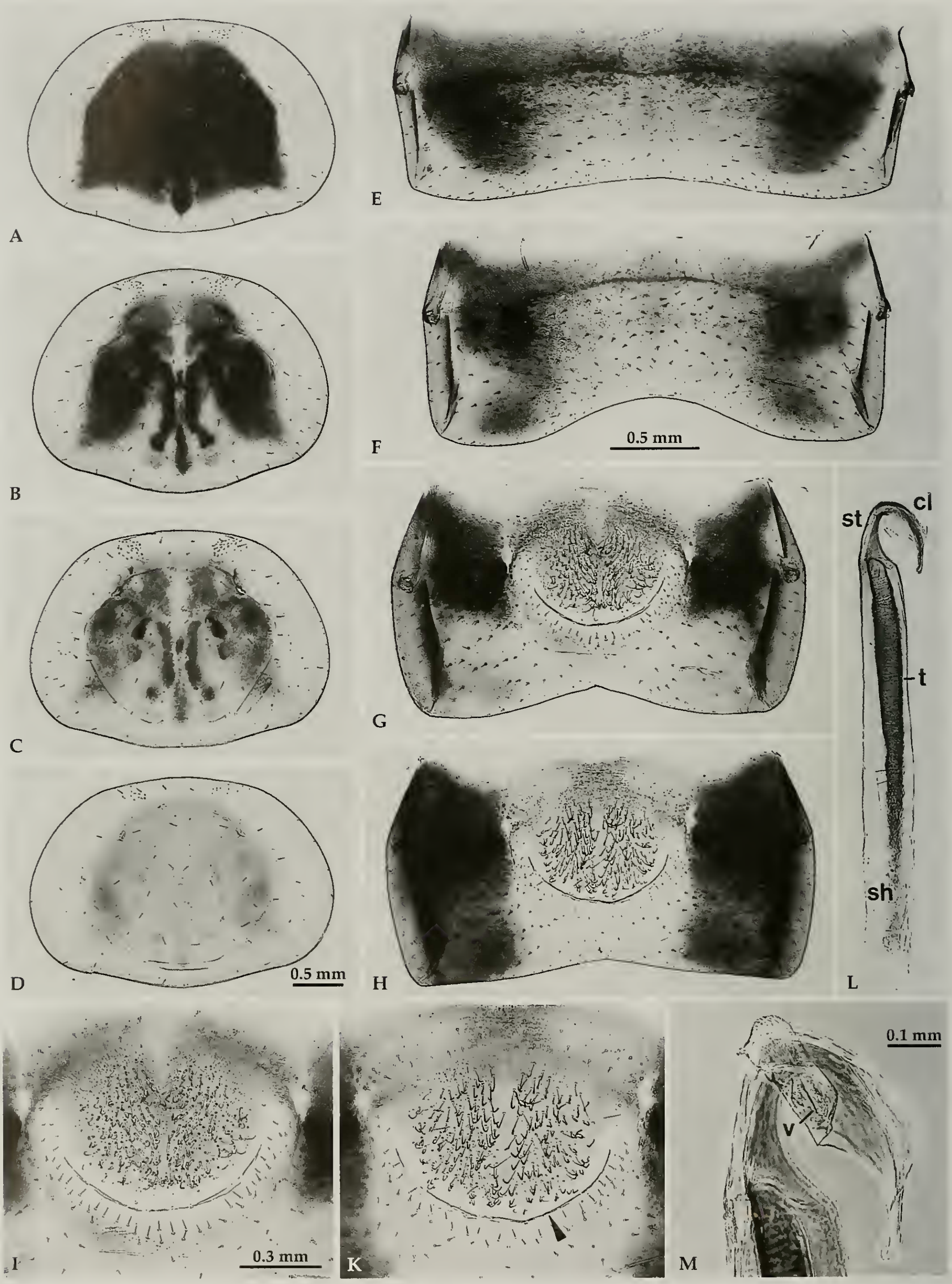

Fig. 5. *E. ticinus,* male structures. Pronotum (**A-D**), T5 (**E**), T6 (**F**), T7 (**G, H**), glandular pit of T7 (**I, K**, arrow points to posterior contour line), hook of left phallomere (**L**, posterior end on top), claw of hook (**M**). **cl** claw, **sh** shaft, **st** stalk, **t** trough, **v** velum. Same scale for (**A-D**), (**E-H, L**) and (**I, K**). Identification: He 79/3 (**A**), He 79/1, holotype (**B, E-G, I**), He 90/1 (**D**), He 41/3 (**H, K**), He 79/2 (**L**), It 174/1 (**M**).

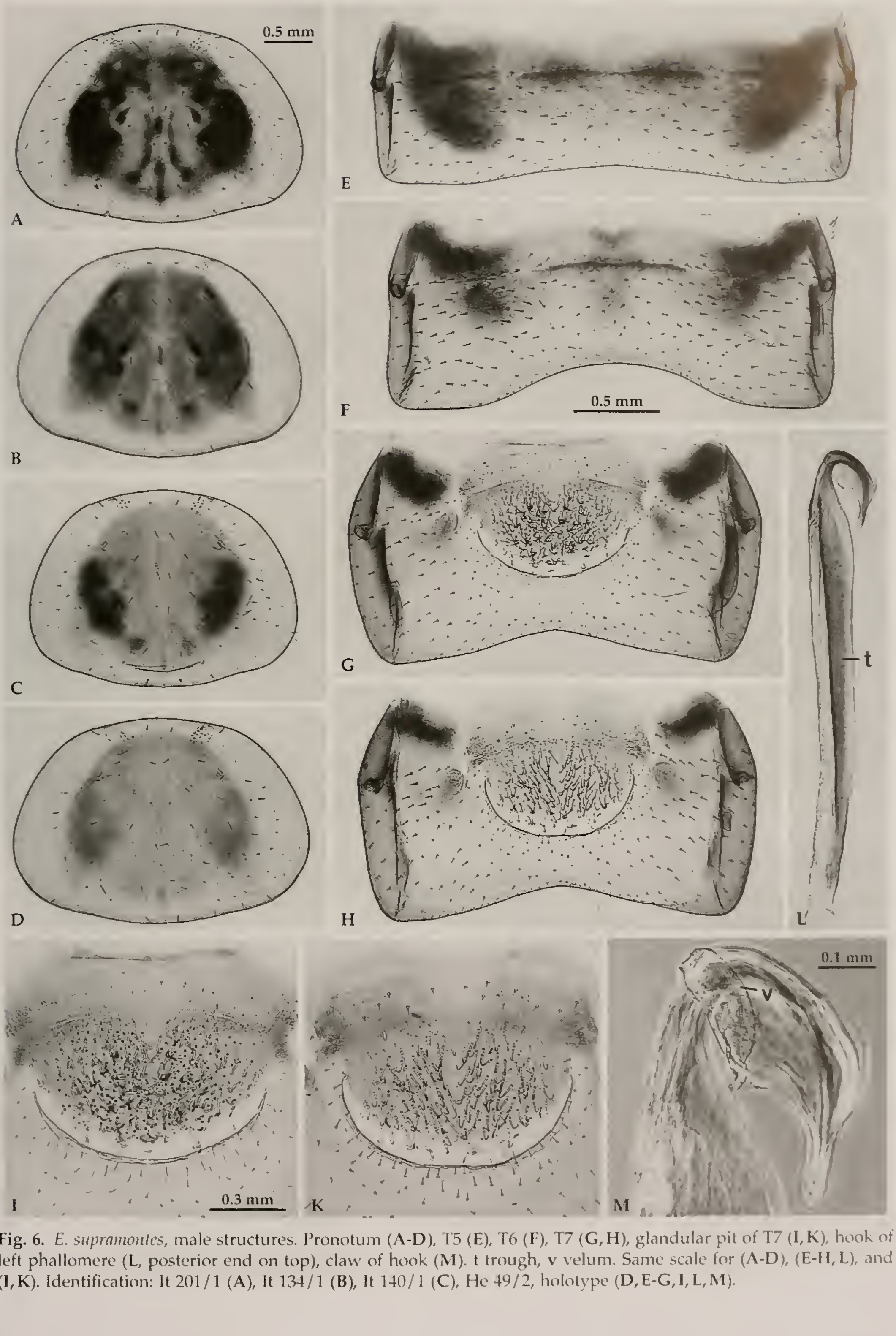

Fig. 6. *E. supramontes*, male structures. Pronotum (**A-D**), T5 (**E**), T6 (**F**), T7 (**G, H**), glandular pit of T7 (**I, K**), hook of left phallomere (**L**, posterior end on top), claw of hook (**M**). **t** trough, **v** velum. Same scale for (**A-D**), (**E-H, L**), and (**I, K**). Identification: It 201/1 (**A**), It 134/1 (**B**), It 140/1 (**C**), He 49/2, holotype (**D, E-G, I, L, M**).

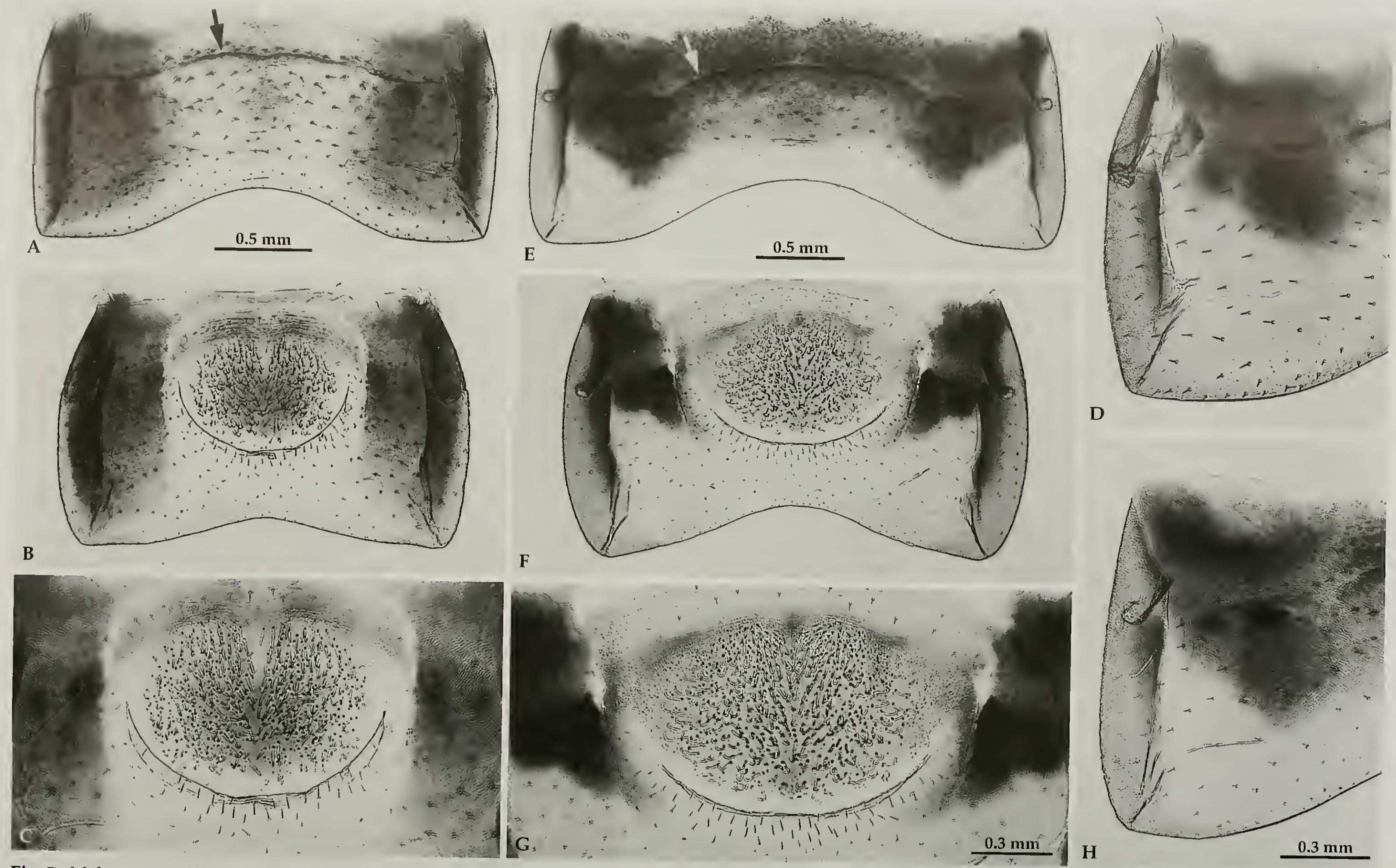

Fig. 7. Male tergites. **A-D.** *E. sylvestris.* **E-H.** *E. lucidus.* T6 (**A, E**), left margin of T6 (**D, H**), T7 (**B, F**), glandular pit of T7 (**C, G**). The arrows point to the transversal ridge of T6. Same scale for (**A, B**), (**E, F**) and (**C, D, H**). Identification: He 35/4 (**A-D**), He 55/3 (**E-H**).

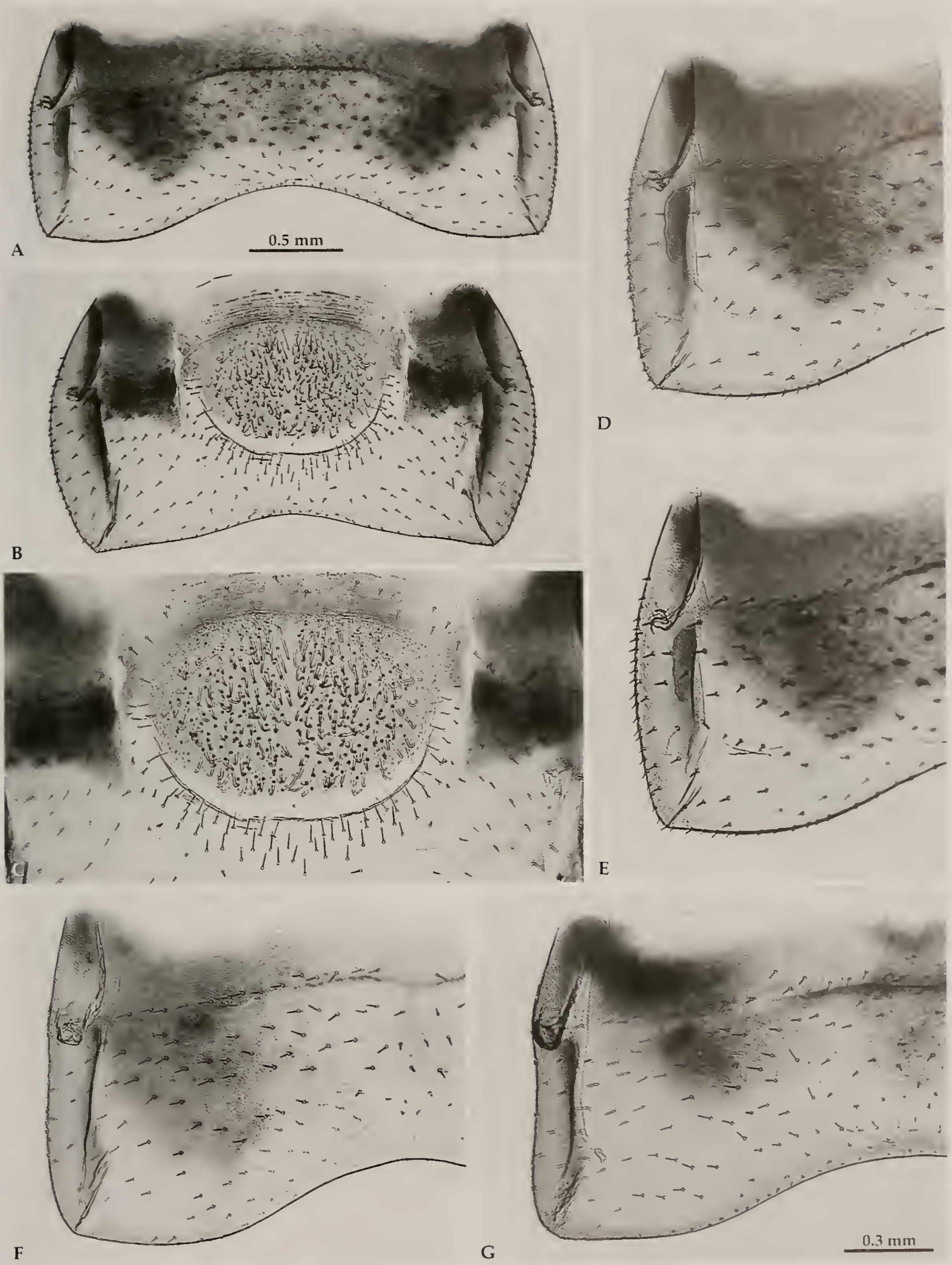

Fig. 8. Male tergites. **A-E.** *E. eckerleini.* **F.** *E. ticinus.* **G.** *E. supramontes.* T6 (**A**), left margin of T6 (**D-G**; **D, E** same specimen in different focus), T7 (**B**), glandular pit of T7 (**C**). Same scale for (**A, B**) and (**C-G**). Identification: He 28/3 (**A-E**), He 42/1 (**F**), He 49/2, holotype (**G**).

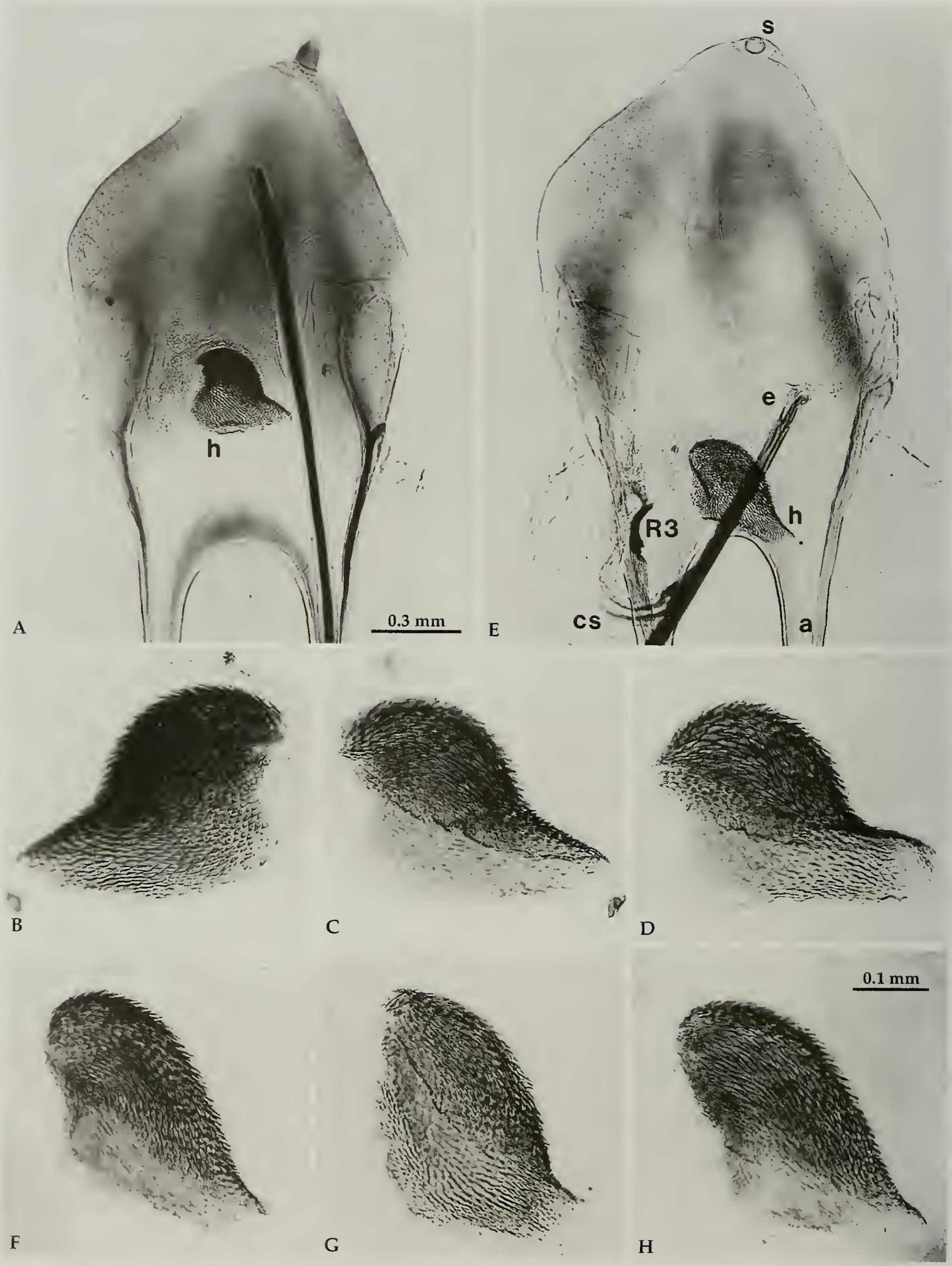

Fig. 9. Male subgenital plate (S9) and helmet sclerite. **A-D.** *E. sylvestris.* **E-H.** *E. lucidus.* Subgenital plate with helmet sclerite in fairly natural position (**A, E**), helmet sclerite in more detail (**B-D, F-H**). Dorsal view except for **B** (ventral view), posterior end on top. **a** anterior apodemes of the subgenital plate, **h** helmet sclerite, **s** (left) stylus; parts of the right phallomere: **R3** sclerite, **cs** cleft (both removed in A); left phallomere: **e** endophallic apodeme (hook removed). Same scale for (**A, E**) and (**B-D, F-H**). Identification: Bo 564 (**A**), It 123/2 (**B, C**), It 111/2 (**D**), He 4a/1 (**E**), He 55/1 (**F**), He 55/2 (**G**), He 56/1 (**H**).

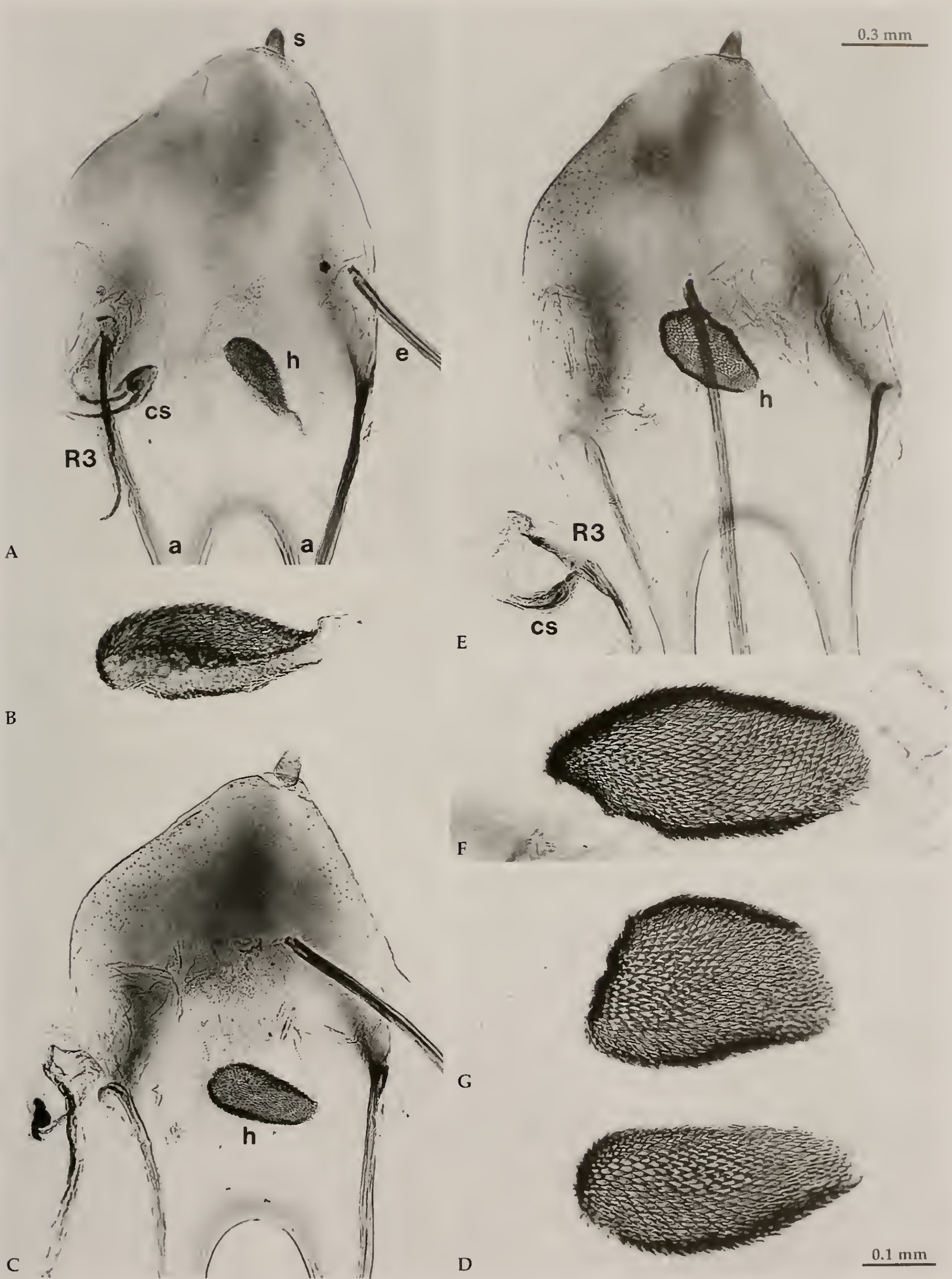

Fig. 10. Male subgenital plate (S9) and helmet sclerite. **A-B.** *E. eckerleini.* **C-D.** *E. supramontes.* **E-G.** *E. ticinus.* Subgenital plate with helmet sclerite in fairly natural position (**A, C, E**), helmet sclerite in more detail (**B, D, F, G**). Dorsal view, posterior end on top. For abbreviations see preceding figure. Same scale for (**A, C, E**) and (**B, D, F, G**). Identification: He 28/3 (**A**), F 104/3 (**B**), He 49/1 (**C**), He 49/4 (**D**), He 79/1, holotype (**E**), He 79/2 (**F**), It 173/1 (**G**).

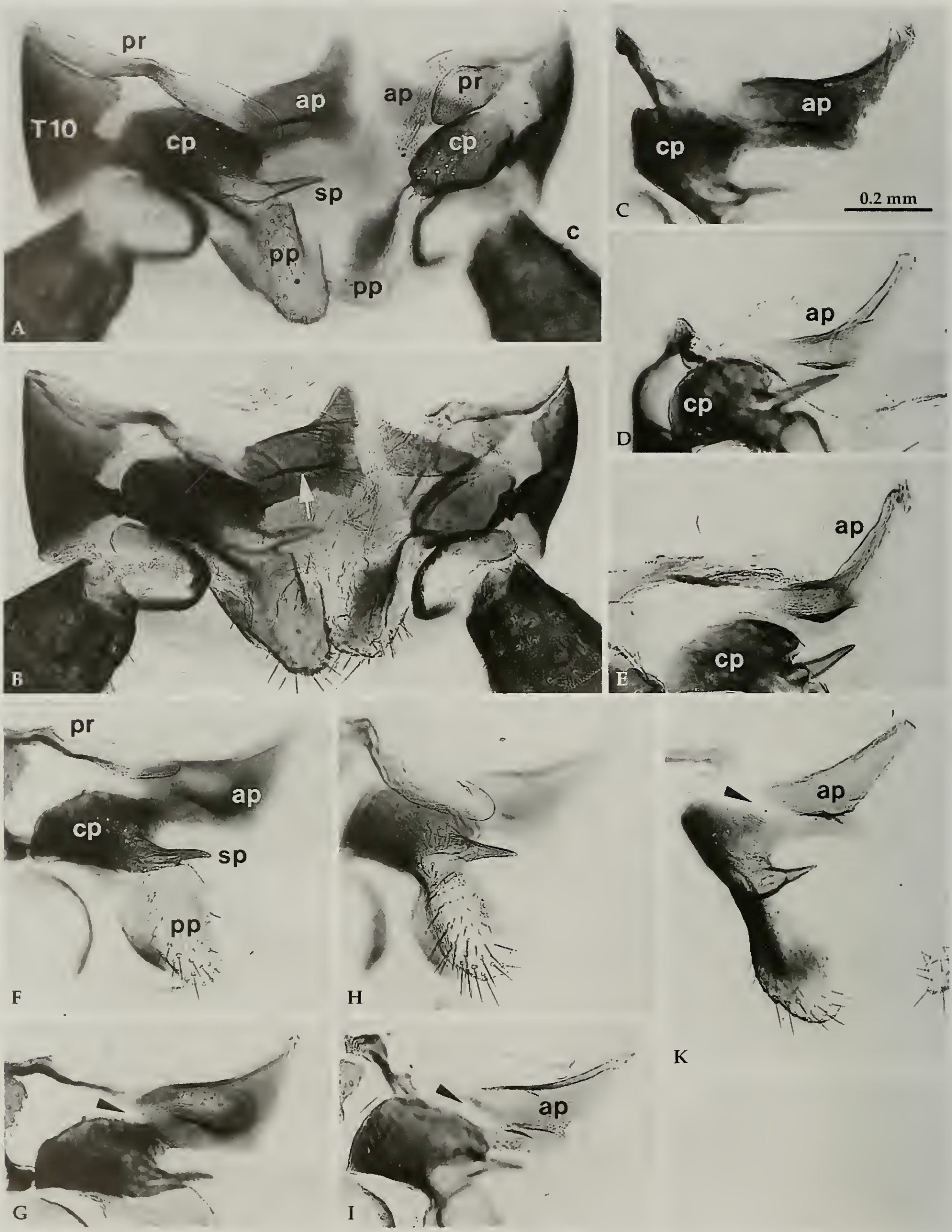

Fig. 11. Male paraprocts and praeparaprocts. **A-C.** *E. lucidus.* **D-E.** *E. sylvestris.* **F-G.** *E. eckerleini.* **H-I.** *E. supramontes.* **K.** *E. ticinus.* (**A, B**) last abdominal segment showing paraprocts and praeparaprocts of both sides; (**C-K**) only right paraproct or part of it shown. In three cases the same structures are photographed twice with different focussing: (**A, B**), (**F, G**), and (**H, I**). Ventral view. **c** cercus, **pr** praeparaproct, **T10** tergite 10; paraproct parts: **ap** medio-anterior arm, **cp** central part, **sp** spine (only on the right), **pp** medio-posterior arm. Arrow in (**B**) points to border between distal (on top) and proximal part of the medio-anterior arm, in **G, I** and **K** to an incision between these two parts. Same scale for all figures. Identification: Bo 457 (**A, B**), He 55/3 (**C**), He 80/2 (**D**), It 123/2 (**E**), F 104/4 (**F, G**), He 49/4 (**H, I**), It 170/1 (**K**).

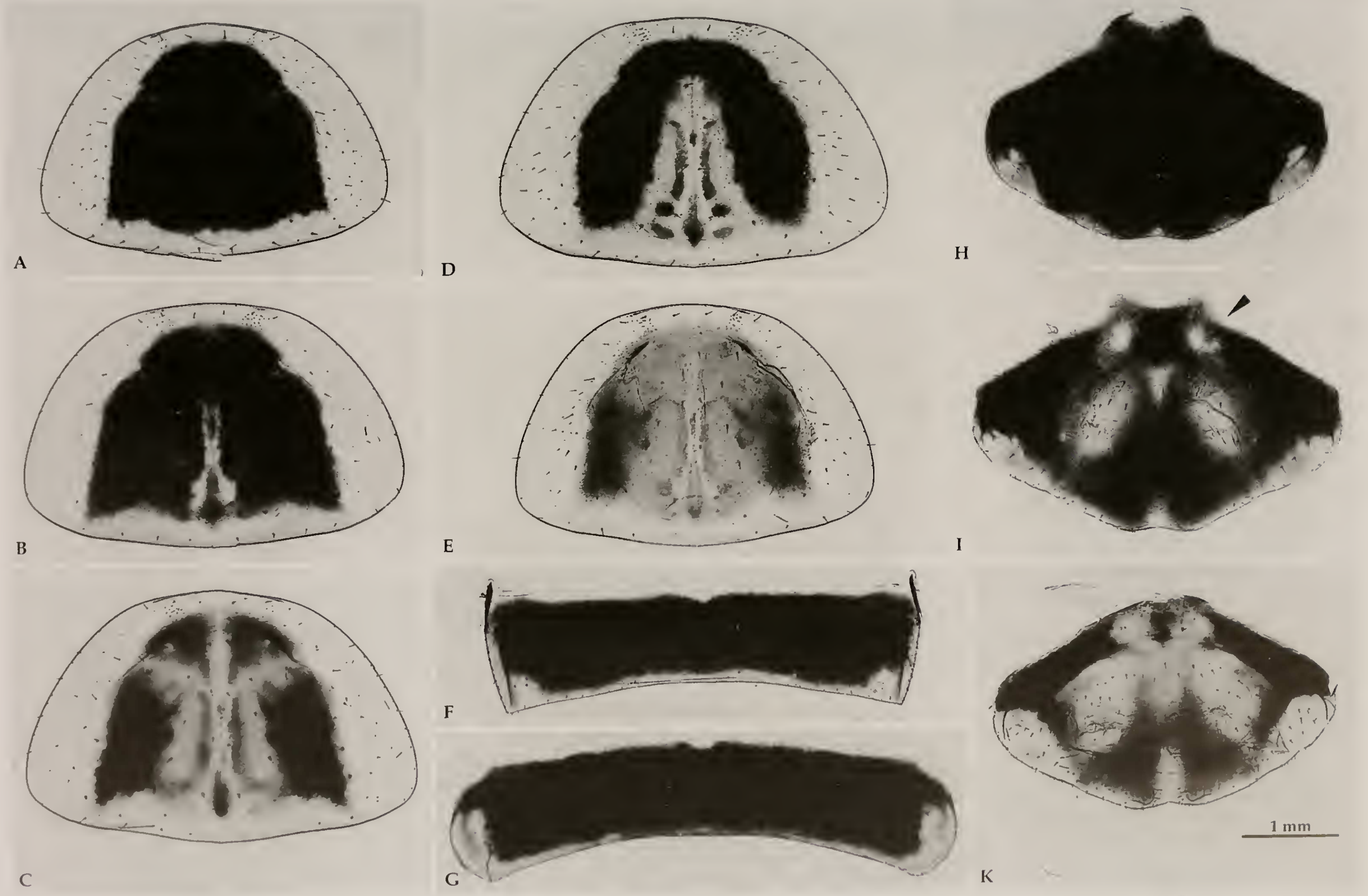

Fig. 12. *E. ticinus*, females, colour pattern of pronotum and abdominal tergites and sternites. Pronotum (**A-E**), T5 (**F**), S5 (**G**), S7 (**H, I, K**). Arrow in (**I**) points to characteristic lightenings of S7. Same scale in all figures. Identification: It 178/2 (**A**), He 41/4 (**B, F, G**), It 170/3 (**C**), It 181/3 (**D**), It 170/2 (**E**), He 89/1 (**H**), He 80/3 (**I**), It 180/1 (**K**).

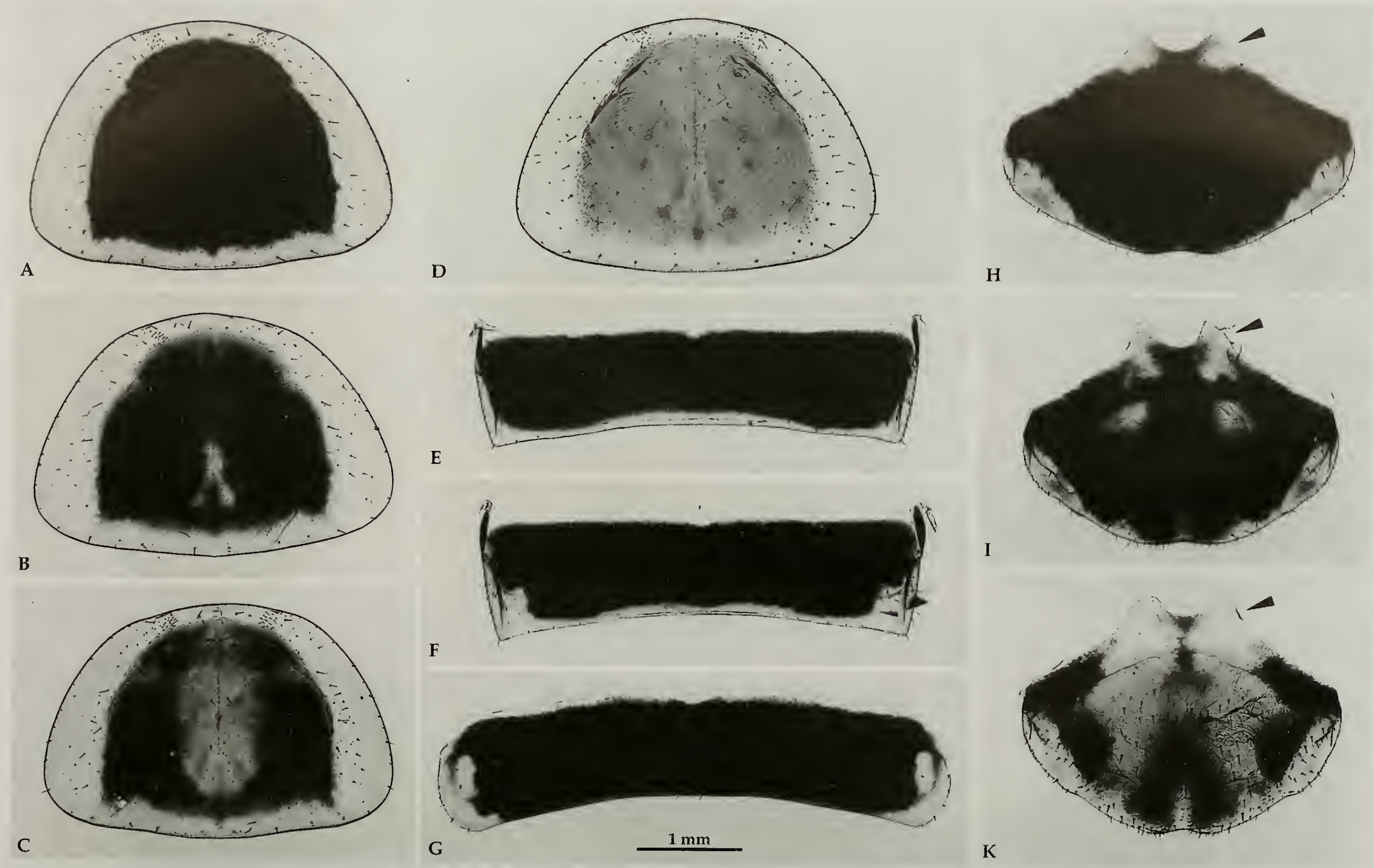

Fig. 13. *E. supramontes*, females, colouration pattern of pronotum and abdominal tergites and sternites. Pronotum (**A-D**), T5 (**E, F**), S5 (**G**), S7 (**H, I, K**). Arrows in (**H-K**) point to characteristic lightenings of S7. Same scale for all figures. Identification: It 189/1 (**A**), It 188/2 (**B**), It 180/3 (**C**), It 188/4 (**D, K**), It 187/3 (**E, G, H**), It 187/2 (**F**), It 188/3 (**I**).

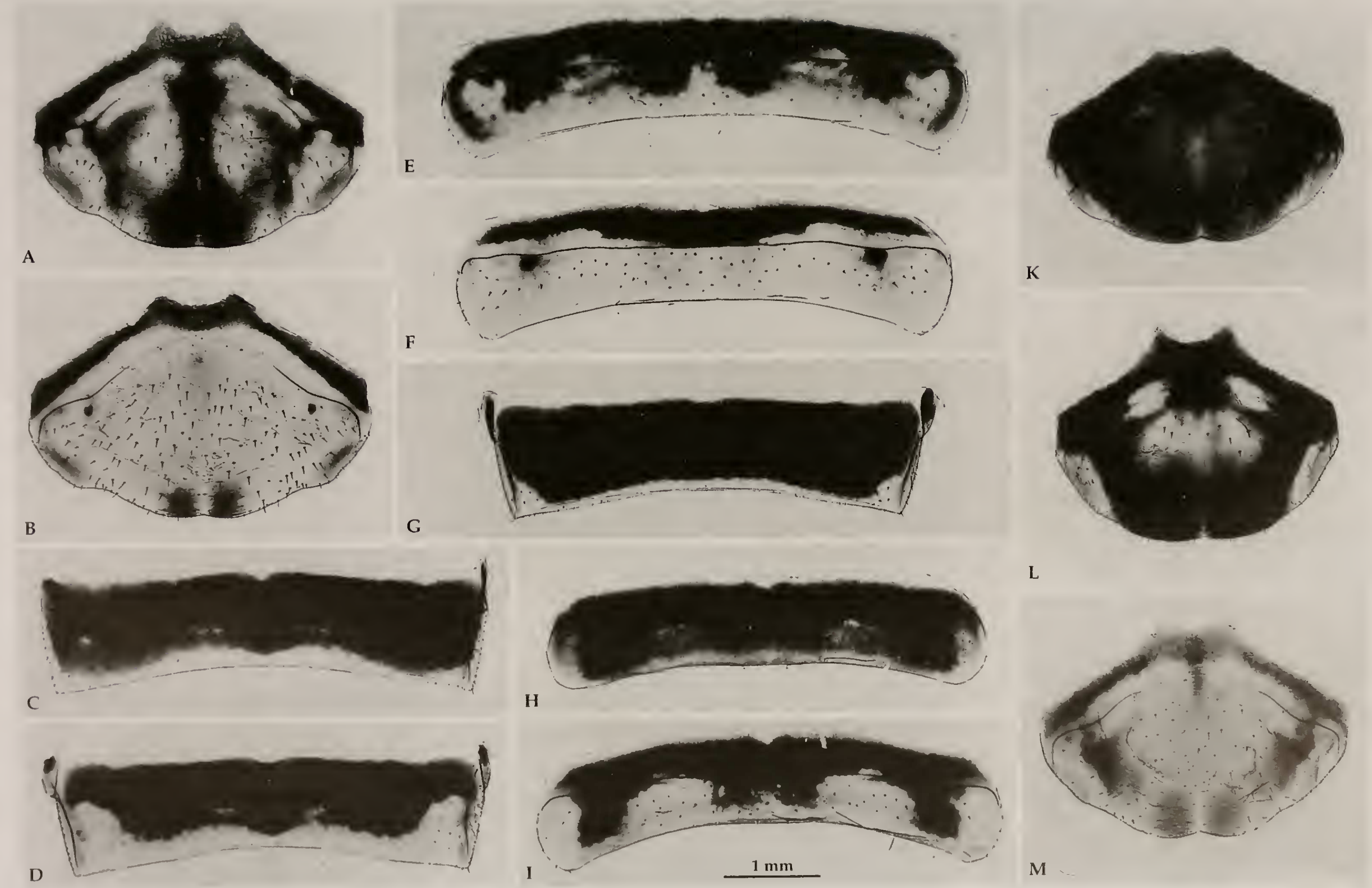

Fig. 14. Females, colour pattern of abdominal tergites and sternites. **A-F.** *E. lucidus*. **G-M.** *E. sylvestris*. T5 (**C, D, G**), S5 (**E, F, H, I**), S7 (**A, B, K, L, M**). Same scale for all figures. Identification: He 55/4 (**A**), He 55/5 (**B**), He 55/4 (**C, E**), He 31/4 (**D, F**), He 75/1 (**G**), He 20/1 (**H**), He 87/2 (**I**), He 20/7 (**K**), Bo 659 (**L**), Bo 651 (**M**).

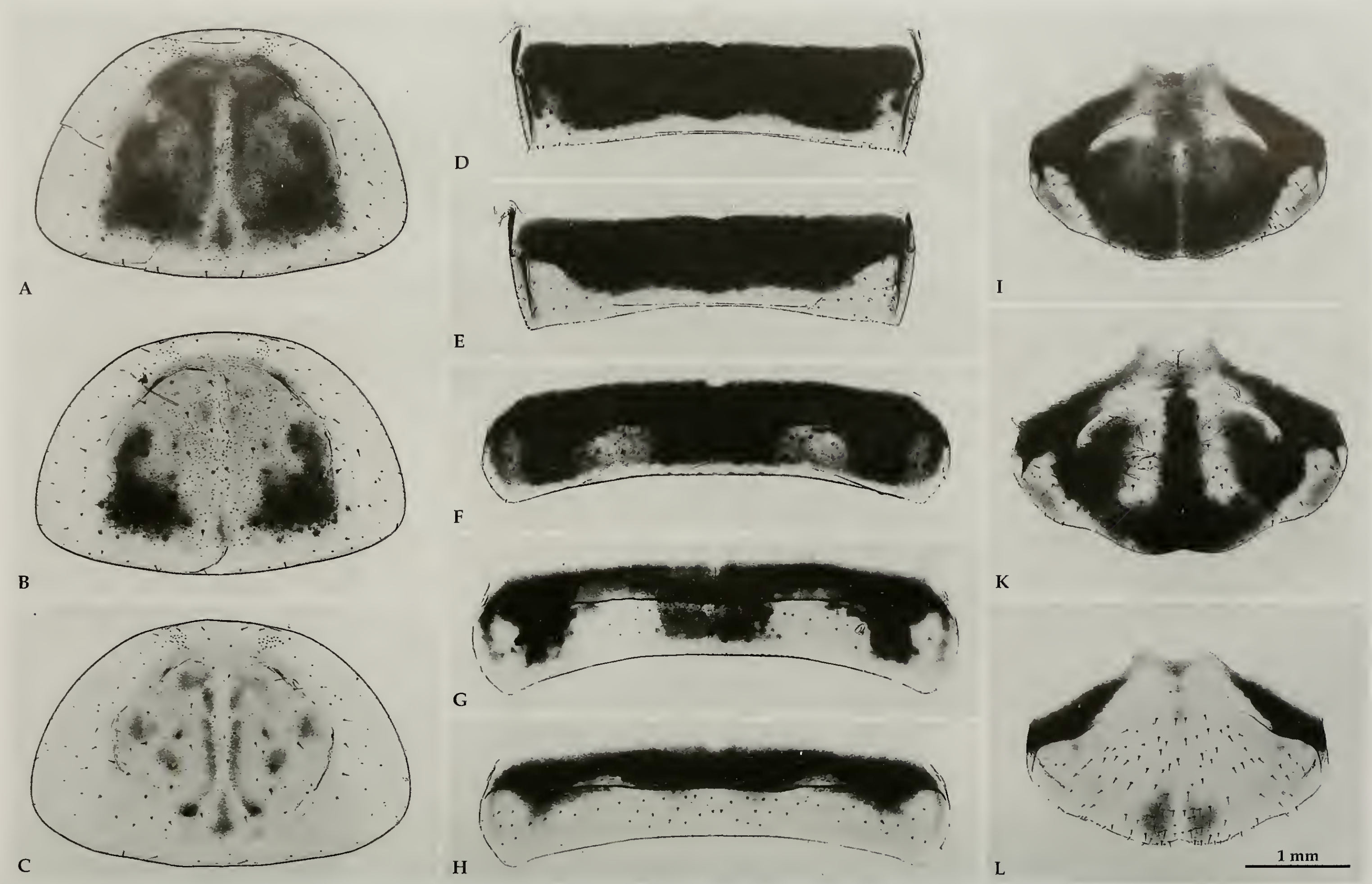

Fig. 15. *E. eckerleini*, females, colouration patterns of pronotum and abdominal tergites and sternites. Pronotum (**A, B, C**), T5 (**D, E**), S5 (**F, G, H**), S7 (**I, K, L**). Same scale for all figures. Identification: F 104/6 (**A**), F 104/7 (**B, D, F**), He 14a/2 (**C, G, K**), F 25/5 (**E**), F 25/4 (**H**), F 24/8 (**I**), F 24/7 (**L**).

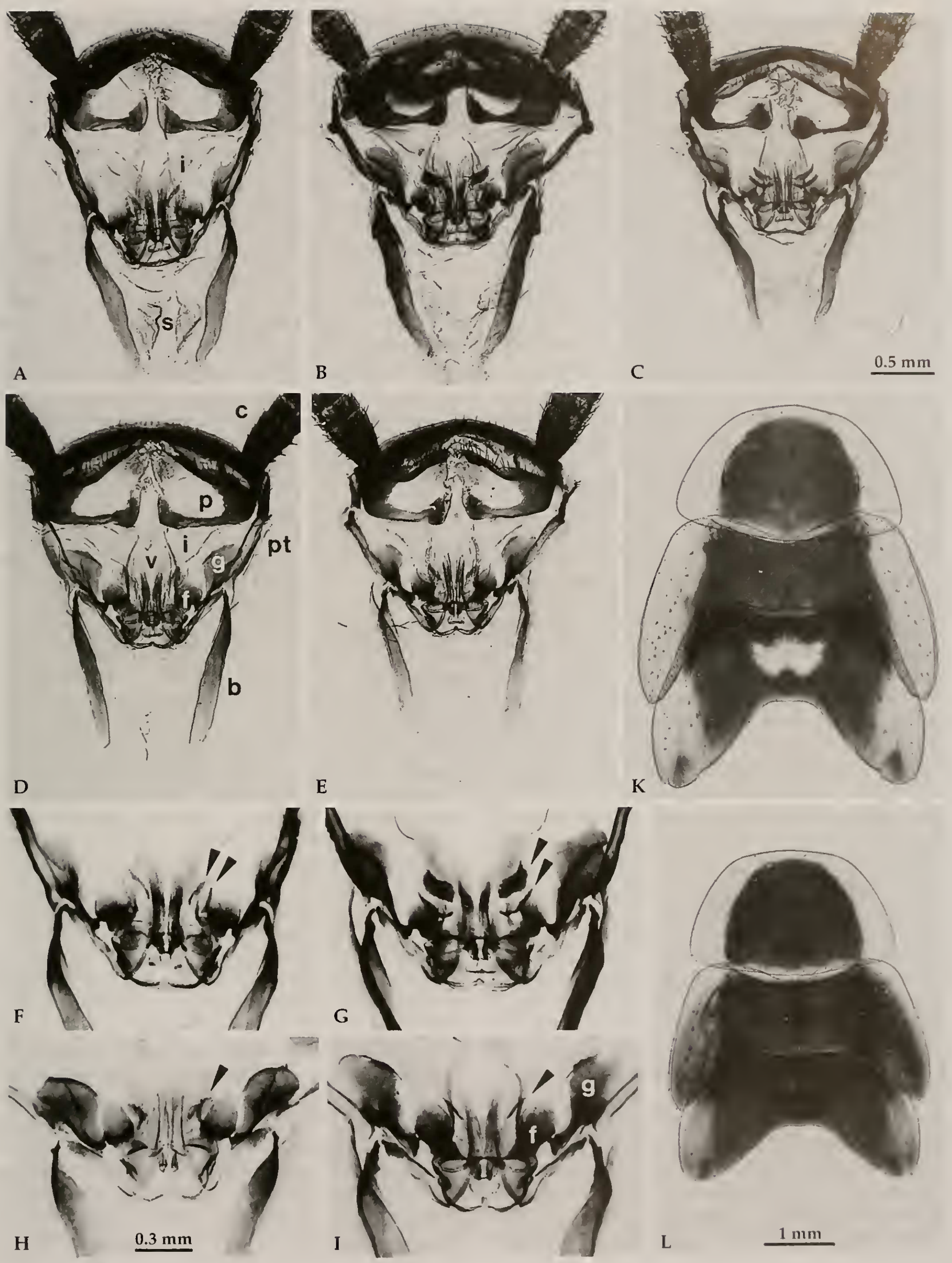

Fig. 16. A-I. Females, dorsal complex of genital sclerites, posterior end on top. (A-E) Complete structure, ventral view; (F-I) detail, dorsal view, arrows pointing to the prae-intercalary sclerites. **b** basivalvular sclerites, **c** cercus, **f** valvifer II, **g** gonangulum (laterosternite 9), **i** intercalary sclerite (weakly sclerotized), **p** paraproct, **pt** paratergites 8,9, **s** spermathecal plate, **v** valves of ovipositor. **K-L.** Larvae (last stage), colouration of thoracal nota. **A, F.** *E.sylvestris.* **B, G.** *E. lucidus.* **C.** *E. eckerleini.* **D, H, K.** *E. ticinus.* **E, I, L.** *E. supramontes.* Same scale for (A-E), (F-I), and (K, L). Identification: He 87/2 (**A, F**), He 55/5 (**B**), F 99/4 (**C**), It 181/2 (**D**), It 187/2 (**E**), He 55/4 (**G**), It 178/2 (**H**), It 202/1 (**I**), It 180/3 (**K**), It 181/3 (**L**).